Acoustic illuminations: recorded space as soundscape composition

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Introduction

> It is the nature of perception that is the fundamental ground from which all music arises and not its materials, structures or communicative intent. As Elaine Barkin says, "Listening is primary composition" (Dunn, 2001, p. 6).

I became involved with spontaneous and exploratory music culture after completing my degree in jazz performance at the Sydney Conservatorium in 2000. This cultural network is represented by participants coming from a broad range of backgrounds and disciplines[1] and sustains itself by a somewhat political drive to function independently from the hegemonies of mainstream institutions and industries. Nevertheless, when opportunities to collaborate or to receive funding are presented, ventures into such mainstream domains may be embraced and some participants practice professionally in fields that do not necessarily share the same philosophical, ideological or aesthetic perspectives. My association with this cultural network has led to many interdisciplinary encounters and several ongoing collaborations.

Because spontaneous and exploratory music culture operates on the fringes of the arts world, public performances rarely take place in conventional venues such as concert halls and auditoriums. Alternative venues, including warehouses, art galleries, community halls, underground car parks, gardens, bush reserves and private homes, are used instead. Places like these can have distinctive or unpredictable acoustic characteristics and constraints; for example, loud sounds coming from outside, long reverberation, or neighbours requiring that performances be of extremely low volume. In the context of some of these performances I began to observe the extent to which spaces and in particular their acoustic features, can become as important a part of the music as the dynamics between participants, including the audience.

Consequently, both on my own and with others, I started seeking out locations specifically in order to engage their acoustic idiosyncrasies. When some outdoor locations were visited on multiple occasions,

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[1] These include conceptual art, theatre, painting, sculpture, instrument building, improvised music, poetry, disc-jockeying, computer programming, dance, photography, film and animation.

the highly varied musical outcomes could be attributed to different seasons or weather conditions, as well as to those participating. For documentation purposes, many of these early field trips were recorded, but with a very basic level of expertise. From this arose technical and philosophical questions, in particular, how I might produce acousmatic works by fully integrating recording into the creative process. Research undertaken at the University of Canterbury, for my honours paper *Outdoor Studio* (Derrick, 2009), identified some of these challenges and established the need for a more sustained and focussed exploration into this way of making music. Rather than being merely a means by which to present improvised music, the recording process itself became a creative and exploratory activity, one in which the microphone was treated as a musical instrument. The realisation that composition can occur through the act of listening prompted a shift towards direct engagement with spatial, temporal, acoustic, geographic, social and narrational aspects of the location. Some of the field recordings explored in *Outdoor Studio* had been made during my visit to Sri Lanka in 2009. The main purpose of this visit was for *Baliphonics,* a collaborative project between traditional ritual artists and western improvisers, facilitated by my close musical ally Dr. Sum Suraweera.[2]

My receipt of a doctoral scholarship from the University of Canterbury has allowed me to continue with this creative research into making music through field recording and performance. Further awards from the Farina Thompson Charitable Trust Music Scholarship, the Keith Laugesen Music Scholarship and the Douglas Lilburn Prize for Composition have allowed me to purchase professional microphones and portable recording equipment necessary for this research and to undertake field recording in Sri Lanka and Australia.

Field recording is a fundamental part of my soundscape composition, which focuses on space that is filled with sound, rather than on sound sources themselves. I refer to this phenomenon as ‘acoustic illumination’ because it is analogous to optical phenomena such as reflection, refraction (filtering), absorption, colour, intensity, texture, density, transformation, representation and perspective which can

[2] A video excerpt from a *Baliphonics* performance can be viewed online, at http://youtu.be/jXW9eNiVU0k

also apply to the acoustic realm. Locations can be fascinating when their cultural, biological, geographical and meteorological dimensions are encoded within their acoustic. Thus, an important way of engaging with place is through its acoustic magnitudes when perception is focused, from different perspectives, on how sound sources illuminate their surrounding space. 'Acoustic illumination' can also occur by oneself generating sounds. Through the acoustic lens of the microphone, space becomes 'recorded space', which is at the very heart of my soundscape composition.

Part I of this dissertation examines the theoretical and philosophical background to soundscape composition and in Part II my submitted compositions are discussed.

Chapter 1 reviews a broad range of artists and researchers whose work relates to, and overlaps with, my own. My work draws upon ideas, methods and philosophies from field recording and improvisation, neither of which belong to specific autonomous disciplines. Different ways on which field recordists focus on environmental sound are discussed and my own position examined.

Chapter 2 explores how terms, fundamental to discussing soundscape composition, are defined in different cultural and historical contexts; some definitions are broad whereas others are very specific. In order for these terms to be useful, my understanding of them is delineated and where necessary differentiated from commonly accepted ways of understanding. Several different ways of categorising environmental sound are compared and assessed as to their practical and theoretical suitability when analysing soundscape composition.

Chapter 3 explores different concepts of listening and how these apply to our rapidly changing acoustic environments. Ways in which our listening sensitivities may be shifting are introduced and some of the consequences of these shifts noted. Reasons for engaging with soundscapes are proposed by considering notions of representation and authenticity. The creative use of contemporary technology is proposed as a way of exploring soundscapes.

Chapter 4 introduces creative processes that have emerged from my fieldwork. Although particular techniques were conceived and researched along the way, the spontaneous nature of my work meant that their implementation sometimes required alteration, thereby yielding unforeseen results.

Each chapter in Part II features one or more compositions from a specific location. Locational, acoustic, creative and technical elements are described and analysed by drawing upon theoretical perspectives, practicalities and conceptual positions explored in Part I. An overview of Part II is as follows:

Chapter 5—*Poranui,* which focuses on sounds coming from a single source.

Chapter 6—*Hinewai Reserve,* which focuses on serendipity.

Chapter 7—*Sydney Harbour,* which focuses on engagement with place through performance.

Chapter 8—*Kura Tawhiti,* which focuses on echo.

Chapter 9—*Remains,* which focuses on transience and emotion.

Chapter 10—*Sri Lanka,* which focuses on spatial modulation.

The body of work this research has produced represents a significant part of my musical evolution. The purpose of this dissertation is to track this evolution by critically addressing my compositions in order to prompt and engage questions and ideas which might, in turn, be considered in the context of any musical work focusing on soundscape.

Part I: Theoretical background

1 Listening and performance as compositional strategies

I listen. I seek out a dry spot amongst the damp leaves on the forest floor. I place my field recorder there. I carefully attach microphones to the dripping branches of a nearby tree. I turn on the field recorder. Still listening I plug in my headphones and I press record. Already I am performing, even though I have not picked up my clarinet. In fact I probably will not play it at all this time. The music begins to move as layers of texture and rhythm are gradually perceived. Some of these continue like independent little ecosystems, or gradually shift in pitch or density. Others are ephemeral or transient. The stillness is then interrupted by a breeze and I relocate my microphones beneath the rustling leaves. Here listening and performance are informing and defining one another.

In this chapter I establish a foundation on which soundscape composition can be located and discussed by reviewing practitioners and theorists whose work is relevant to my approach.

1.1 Improvisation and field recording

> In all its roles and appearances, improvisation can be considered as the celebration of the moment. And in this the nature of improvisation exactly resembles the nature of music. Essentially, music is fleeting; its reality is its moment of performance. There might be documents that relate to that moment—score, recording, echo, memory—but only to anticipate it or recall it (Bailey, 1993, p. 142).

For the improvising musician context is the fundamental variable. Contexts can be cultural, social, musical or locational; they present challenges which, in order for musical cohesion to emerge, encourage improvisers to adapt and extend their vocabulary. As Steve Lacy puts it, "always being on the brink of the unknown and being prepared for the leap"[3] is crucial for sustaining creative engagement, in which elements of uncertainty, unpredictability and risk are presented. Collaboration with artists from different cultural backgrounds and creative disciplines is one such context I have experienced through

[3] From a 1974 interview with Derek Bailey, published in *Conversations* (Lacy, 2006, p. 51).

my involvement with *Baliphonics*. This collaboration could have occurred only through the close musical and personal relationship with the ritual artists, which Dr. Sumuditha Suraweera had developed during his PhD research. Encountering a highly sophisticated and responsive cultural tradition, of whose forms, vocabulary and history Misha Marks, Isaac Smith and myself knew almost nothing, was necessarily negotiated through our willingness to be intuitive, sensitive and deliberate in using complimentary, contrary, interjectural or mimetic musical tactics. The following diary entry describes this experience:

> During the first few rehearsals I focussed on observing and analysing what the ritual artists were doing in terms of tonality and form, anticipating that their drumming and chanting would provide an interpretive foundation on which to establish strategies to explore further during subsequent rehearsals. However, I found that tonality and form, rather than being consistent musical elements of the ritual, were apparently unpredictable and varied. It was obvious that this approach to the collaboration was not going to work. I discovered that when I engaged primarily with the dancing and by asserting my rhythmic, melodic and timbral ideas with more confidence, a musical dialogue began to emerge (Excerpt from the composer's diary, 2009).

Part of *Taonga Pūoro* musician Dr. Richard Nunns's philosophy is to collaborate with people all over the world; this has led to his working with musicians from diverse cultural backgrounds and musical traditions. For Nunns, the context of culture is of equal importance to that of location; in traditional *Taonga Pūoro* performance, one's understanding of cultural responses to environmental characteristics is crucial (Whalley, 2005, p. 58). This awareness of how environmental acoustic phenomena inform and characterise music making has inspired Nunns to explore performance in locations around the world where geography, climate and local animal life constitute their unique sonic character.

In 2013 and 2014 New Zealand artist Phil Dadson curated *Sounding Tiritiri Matangi*, an event taking place on a bird sanctuary island near Auckland. Dadson commented: "In the spirit of the rich diversity of bird and bush life on Tiritiri, some twenty-plus artists/musicians will create surprise 'sonic encounters' for a visiting audience to experience as they wander the tracks through Wattle Valley and around the lighthouse" (Dadson, cited in Eventfinda, 2014). This event provided a context in which visitors were enabled to create their own experiences. Many of the musicians who participated are also closely involved with the creative communities described in the Introduction.

The Australian organisation *Out Hear* has, since 2011, been arranging public events in various outdoor locations where guided sound walks and improvisational performances take place, using both found objects and musical instruments.[4] Its founder, Dale Gorfinkel, describes the project's purpose as "to encourage a culture of music, sound and listening experiences in Australia's special outdoor spaces. Outdoor performances and sound walks provide a fresh context for engagement with sound and place" (Gorfinkel, 2011). *Out Hear* participants have produced several recordings of improvised music in outdoor locations. Of one of these, Jim Denley's 2007 CD *Through Fire, Crevice and the Hidden Valley*, Denley writes "Presumably people have been making music in these spaces for thousands of years, but it's almost certain sax hasn't been heard there before" (Denley, 2007). When I asked Denley why he chose to play in particular environments, he replied:

> Australia has unique geography, history, weather, flora and fauna, and all the elements conspire to create wonderful sonic environments. I've found this in our forests, the sandstone caves of Sydney, the desert clay pans of western NSW, down the Todd River in central Alice, or amongst the boulders of Tibooburra. If you can plunge into these worlds and play with the elements, then you can engage with the place in a way that we rarely, at other times, do (Denley, 2009).

Implicit in the work of these improvisers is the desire to establish a bond not only with their listeners but also and in particular with place, through creative acoustic engagement. It is precisely this locational context and especially that of outdoor environments, which I too engage. However, in my recorded works instrumental performance is not necessarily foregrounded, sometimes becoming more an ambient acoustic presence or even not featured at all. Another important point of difference is that in my work spatial and temporal perspectives are often fragmented, distorted or abstracted by using experimental microphone techniques and/or by making interventions during editing.

It is through a sensitivity to the acoustic dimensions of geography, biology and culture that "knowing when not to play" (Nunns, 2011) becomes necessary in allowing one to temporarily become a part of the environment. It is in this context of relative silence that my soundscape compositions occur. They

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[4] Information on upcoming and past *Out Hear* events can be found online at http://outhear.com/

focus on direct engagement with relative silence in ways spontaneous and exploratory. In *Zero Decibels: The Quest for Absolute Silence*, George Foy describes how an Apache flute player approaches playing in this context:

> For Nighteagle, improvising on the flute allows him to feel the land around him, its sounds and sights and smells, and translate for others in music what they mean to him (Foy, 2010, p. 116).

It is this individuality of perception that I closely identify with, albeit without having come from the same cultural tradition as Nighteagle. Although I sometimes use conventional musical instruments (clarinet and saxophone), the microphone has become the primary means through which I engage locations in my soundscape compositions.

Early sound reproduction technologies, emerging in the late 19th century, established the foundations of modern bioacoustics and ethnomusicology, fields which had hitherto documented sound by using verbal descriptions, graphic notation, numerical notation, and staff notation, all of which can provide only a superficial guide. The technological breakthrough irrevocably changed the nature of both fields by allowing sound to be documented in a profoundly new way; what had previously been described visually could now also be acoustically reproduced. By the mid-20th century field recording was being used to create sound effects for film and radio, profoundly conveying and evoking specificities of place; for example, atmosphere, climate, weather, architecture, geography, culture, season and time of day.

Prior to digital technology emerging in the late 20th century, high definition, portable, recording equipment was cumbersome and sometimes temperamental, especially in locations with extreme environmental conditions. High costs and expert technical requirements often restricted its accessibility to institutions supporting specialist fields such as ethnomusicology, bioacoustics, zoology, surveillance, cinema, media, and electronic music. Similarly, editing techniques previously requiring access to a studio facility, can now be applied on a personal computer. Digital technologies have opened up the possibilities of field recording to individual practitioners from all disciplines.

In the Field: The Art of Field Recording (Lane & Carlyle, 2013) is a collection of interviews with artists who use field recording in their work. These artists represent different generations and nationalities and

come from a range of disciplines including ethnomusicology, marine biology, communications, composition, fine arts and film. Whereas some consider themselves to be ‘composers’, others describe themselves as ‘sonic artists’, ‘sound recordists’, or even prefer not to be labelled. My investigation into the aesthetic, philosophical and technical positions apparent in these interviews, reveals three themes which are integral to soundscape composition:

1. Reasons for field recording
2. How the artist’s presence manifests in their works
3. Ways in which performance can be a part of field recording

The first theme explores reasons for field recording. Jez Riley-French describes why he records sound, what he looks for in his recordings and why engaging the listener is important:

> I record because I like the sound of something. But when it comes to deciding, as I listen back, which one of those recordings might work in a wider, more public, context, I tend to select those recordings which are ones that, to my ear, capture the experience of recording in that space. I’m really interested in representing something of my personal joy, exploration and pleasure of being in that place and listening to those sounds […] My background from a young age has been that of an improvising, intuitive musician and there is something parallel there; it’s that moment when everything works and the audience becomes part of the music itself (Riley-French, cited in Lane & Carlyle, 2013, p. 161).

French’s view that the audience is a vital part of the musical process highlights how, in field recording, the focus of context necessarily extends beyond that of the recorded, into that of diffusion.

Steve Feld considers field recording to be a way of interrogating the act of listening, when perceived meanings embedded in the recorded world can become compositional material:

> [Field] recording is a way of amplifying experience, a way of helping people question—and it certainly has helped me question—what it means to be a listening agent and what it means to be a listening subject […] Recording wasn’t just about gathering things but it was the invitation to a conversation about what was going on in the world as recorded, about what we were listening to, how we knew and questioned the world by listening to it, how we edited and arranged its meanings like a composition (Feld, cited in Lane & Carlyle, 2013, p. 212).

For Davide Tidoni and Manuela Barile, the desire to find meaning is more introspective:

> Recording implies an ongoing questioning and understanding of the self; an awareness-raising process about your capacities and orientation in respect to a certain space, situation or context (Tidoni, cited in Lane & Carlyle, 2013, p. 75).

> [You] find something from outside yourself that helps you better express what is hidden inside—something that corresponds to your mood maybe, it's like your body loses its boundaries and you feel expanded and energised by the energy of the place, there's an exchange, it's something magic and unique. When I press the REC button it's as if I stop this magic in time (Barile, cited in Lane & Carlyle, 2013, p. 185).

For Francisco López, field recording facilitates creative encounters:

> […] field recording is essentially a creative way of interacting with reality, rather than 'representing' reality (López, cited in Lane & Carlyle, 2013, p. 101).

Jana Windiren uses field recording to foreground sounds that cannot be perceived by human ears:

> [It] relates to the importance of the inaudible, to that which lies outside our senses and our possibility of perception. This is a field which we are not able to experience and yet other creatures are operating there (Windiren, cited in Lane & Carlyle, 2013, p. 157).

The preceding quotations highlight transformative, ontological and personal factors behind field recording. For some artists, field recording offers a way of exploring their perception of place through its acoustic, physical and/or social elements. For others it is an introspective process allowing them to interrogate the nature of their existence in the context of place (such works might be understood as acoustic self-portraits). In soundscape composition, these different creative approaches to field recording can be adapted or combined.

The second theme, which explores how the artists' physical presence might manifest in their work, shows a divide in approach. For Felicity Ford and Davide Tidoni, being an audible component in their own recordings is important, whether co-incidental or as a feature:

> I think of myself as a found sound in the environment (Ford, cited in Lane & Carlyle, 2013, p. 90).

> My voice inhabits my contemporary recordings as a kind of explicit clarification of my presence in the field (Tidoni, cited in Lane & Carlyle, 2013, p. 75).

In Feld's recordings, the very fact that he was there is sufficient for him to consider his presence to be important, even if it is not audible:

> I am always part of my recordings. I can always listen to my recordings and recover my breath, my bodily presence […] You could say that my field recording praxis is to listen to histories of listening. That is why I am always part of the recording, always present in some way even if that presence is not audibly legible to the listener (Feld, cited in Lane & Carlyle, 2013, p. 209).

By contrast, the position expressed in the following quotations is of a non-interventional approach where an acoustic frame is set in a very deliberate way, thus ensuring the artist does not occupy any of its space:

> I don't want there to be any trace of myself as a physical sound on the recordings, so I cut out my voice, my clothes, my footsteps and things like that. However, I am very aware that I am nonetheless surely present in the recording […] my presence in the recording is created by the recording method, the choice of place, the sense of distance, the angle of the microphone and so on (Sasajima, cited in Lane & Carlyle, 2013, p. 128).

Hiroki Sasajima positions himself in his work as an invisible listener whose presence manifests in the technical aspects of the recording process itself. Ian Rawes's approach is similar:

> My aim is to turn myself into the hole in the wall through which you hear what's on the other side. I determine when and where that hole is but I reject recordings if my own breathing or footsteps are in them and can't be got rid of. Otherwise it's like taking a photo when your finger's poking out over part of the lens (Rawes, cited in Lane & Carlyle, 2013, p. 143).

Windiren's work features very particular sounds which do not include herself or other people:

> I don't want people to identify with me in my recordings or, for that matter with any other people. Yet obviously I am there, listening with my fullest concentration, often in a very solitary fashion […] But it is totally not about me, it is about the content and that is why I really do not want to send around portraits of myself (Windiren, cited in Lane & Carlyle, 2013, p. 155).

The third theme, which is an extension of the second, explores how field recording can encompass performance in the forms of improvisation and one's interaction with space and environmental objects. In her field recordings, Manuela Barile uses her voice to express her connection to the recorded place and to the people who inhabit it:

> When I sing in a place I am the servant of the 'genius loci'—the moods transmitted by the stories and memories of people, my past and present experiences and not [sic] the last but not least, I feel connected with the people to whom my final work will be donated (Barile, cited in Lane & Carlyle, 2013, p. 185).

Andrea Polli and Hildegard Westerkamp describe how they use the microphone in a performative way:

> I certainly can't imagine just sitting in a static place and recording it from a distance. Unless that was to become its own performative event […] the composing then becomes the microphone's movement through space. (Polli, cited in Lane & Carlyle, 2013, p. 20)

> The moving microphone is very much my preference—guiding me and the listener through an environment […] Even though I might have a certain intent beforehand, often the environment suggests all sorts of other possibilities and I will follow some of those spontaneously (Westerkamp, cited in Lane & Carlyle, 2013, p. 118).

Tidoni regards his recording equipment as environmental objects:

> Recording for me includes a certain level of attention for gestures and movements which are in dialogue with the space and dramaturgically interact with the context. I also use microphone and recording equipment in a scenographic way, as objects to play with, things with their own set of distinctive properties, affordances and constraints (Tidoni, cited in Lane & Carlyle, 2013, p. 77).

The preceding four quotations reveal three distinctive approaches to performance in the field. In the first approach, the artist becomes a featured sound source when she uses her voice to improvise. In the second approach the artists interact with the environment by moving the microphone through it in order to create a spatial narrative. In the third approach, recording equipment ceases to be considered a transparent listening instrument, whose only function is to record sound, but instead becomes another part of the environment with which the artist may engage.

A range of philosophical and aesthetic positions and creative approaches; strategic, intuitive and experimental are therefore evident. By taking a position of openness to possibilities presented by different approaches to field recording, I can explore soundscapes in ways that simultaneously foreground their spectral dimensions and engage their encompassing ecologies.

1.2 Between the referential and the abstract

In *Schizophonia vs l'objet sonore: soundscapes and artistic freedom* (1997) Francisco López identifies a major divide between composers who use environmental sound. There are those who adopt a referential, even an agenda-driven position and those who, in the tradition of *musique concrète,* abstract environmental sounds in a way that excludes reference to their environment. Purveyors of 'nature recordings', whose focus on reproducing the pristine soundscapes of healthy ecosystems, can be criticised for pursuing a musical dead end. However, composer and bio-acoustician Bernie Krause asserts his ecological concern by presenting referential recordings in order to draw attention to the precariousness of undamaged environments. Because of human activity, especially noise pollution, many of the ecosystems Krause has recorded no longer exist.

Musique concrete embraces environmental sound as a source from which *l'objet sonore*[5] is extracted for the potential of its spectral characteristics. Audio processing technology offers infinite ways of distorting and multiplying this source material and of simulating acoustic phenomena such as reverberation and spatial modulation. These tools allow the electroacoustic composer to exploit the listener's established associations and patterns of perception by synthesizing and manipulating new sound sources and creating virtual resonant spaces in which to place them. By contrast, my soundscape composition uses processing technology to convey specific aspects of my locational engagement and to sustain their environmental context.

Although his position is closer to the abstract, López negotiates the referential/abstraction divide by insisting that the musicality and the integrity of a soundscape composition is not necessarily compromised by either a referential agenda or by a focus on abstraction. López describes his album *Wind [Patagonia]* as "An extreme phenomenological immersion led by anti-rationality and anti-purposefulness […] A tour de force of profound listening in which every listener has to face his/her own freedom and thus create" (López, 2005). In *Acoustic Communication: Second Edition* (2001) Truax

[5] *L'Objet sonore* is the Pierre Schaefferian term for 'sound object'.

defines this position more clearly by arguing that it is the space between the referential and the abstract where soundscape composition can be most fully explored:

> A dialectic exists between the real and the imaginary, as well as between the referential and the abstract. The artificial soundscape can never be completely referential because it is always being reproduced outside of its original context, which it can never entirely restore. Likewise it can never be wholly abstract without losing its essential environmental quality. It is this interplay between the two extremes that gives vitality to works of this genre (Truax, 2001, p. 237).

Drawing from research in the fields of acoustic ecology (which explores sonic relationships between biological organisms and their environments) and bio-musicology (an emerging field exploring the possible origins of music in biology), composer David Dunn reaches a somewhat opaque position where environmental sounds are re-contextualised in order to explore what he calls "mind in nature" and the "purposeful minded systems of communication" which this represents (1999). However, what is clear is Dunn's nuanced leaning towards the referential:

> In the daily circumstances of life, we are surrounded with a fabric of sound that is the voice of a generative source. When we make music, it is to match the level of that. Music is about matching the fabric that speaks to us on a daily basis (Dunn, 1999).

Dunn's work focuses on understanding non-human acoustic phenomena that he considers to be musical, rather than the expressive characteristics of musical behaviour, to the point that he finds the use of musical instruments in this context contrived (1999). My position as a composer is different from that described by Dunn in that some of my works *do* include instrumental performance. As an acoustic agent who is also an improviser, my acoustic presence sometimes takes the form of playing musical instruments and perhaps this allows me to temporarily become a part of what Dunn calls "mind in nature".

I am not here claiming that this is anything new; historically much music was performed outdoors. An insight into such performance is provided by Krause's experience with the Jivaro tribe in the Amazon Basin:

> With a couple of flutes and a type of rainstick, their music bore a strong relationship to the sounds around them and often appeared to be driven by the constantly shifting 'moods' of the forest's daytime or evening ambience. In one instance, the emotion of the music, in that attenuated moment before an afternoon thunderstorm, became quite sombre and anticipatory. Then, prior to the evening chorus, after the squalls passed a short time later and the ambient forest sound picked up and became more lively, the performance resumed with a more upbeat theme and instrumentation. Echoing the mood of the environment, the tempo increased and the feeling was much more energetic (Krause B. , 2012, p. 67).

In this book Krause explores the extent to which the post-industrial soundscape encroaches into the highly complex and only partly understood acoustic ecosystems of the prehistoric world; he presents a cogent argument that the organisation of human sound originates from our incorporating sounds from such acoustic ecosystems into hunts, ceremonies, language and music. I regard my soundscape composition as in part a re-connection with this primordial way of making music, by using contemporary tools such as sound recording and musical instruments.

After an improvised music performance I gave with some Sri Lankan musicians, towards the end of my most recent visit and following my time working in remote areas, a schoolboy told a friend of mine about how he had enjoyed my clarinet playing because it made him think of the jungle. I had not been specifically trying to conjure jungle sounds, but this did raise the question, had the concert been on the day I arrived from New Zealand, would my clarinet playing have evoked such a response?

2 Towards understanding the acoustic environment as a musical system

As I explore different theoretical positions and creative practices, terms relating to music-making and to soundscapes are examined for their suitability in describing how soundscape compositions may be created and might be understood. The first terms to be addressed are those interpreted differently across several musical genres, thus problematising their use when discussing soundscape composition, which is not aligned with any single stylistic or cultural tradition. I sometimes determine my own nuanced definitions for these terms and reject those I consider nebulous. Where necessary, I formulate my own terms in order to establish an analytical foundation on which to present my soundscape compositions. These terms might also be useful in discussing the work of other soundscape composers.

2.1 Concerning music-making: problematic terms

Different cultural traditions, historical practices and institutions encompass an immense range of ways in which to make music. I compare how certain terms are understood in the institutional context of this dissertation, within my own background in improvised music and in other genres which are pertinent to this work. The purpose of this semantic inquiry is to determine which terms may be relevant in articulating the locus of my work and specifically how these terms are to be understood.

In most Western musical traditions the terms composition, performance and improvisation are used frequently, but often within different relational contexts from that of their origins in European classical music. In this classical tradition the compositional process is one of preparation, a means to an end where a notated work is rendered by performers, usually other than the composer, and even by machines. In this hierarchical schema, performers are specialists whose training allows them to interpret such prescribed compositions, sometimes under the direction of a conductor. Because the performers' position is one of subservience, improvisation is an auxiliary skill, whose usage remains within limits determined by stylistic conventions or by the composer. For example, Baroque continuo parts and melodic embellishments were commonly not fully notated but instead left to the performers'

improvisatory skill. In subsequent compositional periods the cadenza draws upon content from within the composition, in ways that showcase the performer's technical virtuosity. This separation between composer and performer[6], which solidified during the early 19th century, prevails in mainstream Western music education when students major in specialist fields such as performance, composition, arranging, or conducting. Edwin Prévost argues that in this tradition, composition is "not simply [a] medium for prescribing a performance, but a subtle prescription for a network of power relations" (Prévost, 1995, p. 5).

From a different perspective, when jazz musician Steve Lacy was asked to describe, in fifteen seconds, the difference between composition and improvisation, he replied "In fifteen seconds, the difference between composition and improvisation is that in composition you have all the time you want to decide what to say in fifteen seconds, while in improvisation you have fifteen seconds" (Bailey, 1993, p. 141). In the jazz tradition, composition and improvisation overlap as interdependent processes whereby composition defines a structure in which improvisation takes place. However, jazz musicians, to varying degrees, systematically subvert this framework by deconstructing harmonic, rhythmic and melodic elements or by substituting them with their own, thereby through improvisation becoming the 'composer(s)'.

In 'meta-music', the non-idiomatic[7] performance-generated music which Prévost explores in his book *No Sound is Innocent* (1995), improvisation is itself the fundamental creative process which draws upon performers' creative response, rather than any predetermined musical content or cultural lineage. Meta-music resists perpetuating itself as an idiom, a resistance which paradoxically gives it definition. The performer's technical skill is a means rather than a virtue. 'Composition' here becomes an element

[6] A notable exception to this separation is the improvising tradition in church organ music, which predates Bach and culminates in the 20th century French school.

[7] Bailey differentiates non-idiomatic improvisation: "Idiomatic improvisation, much the most widely used, is mainly concerned with the expression of an idiom—such as jazz, flamenco or baroque—and takes its identity and motivation from that idiom. Non-idiomatic improvisation has other concerns and is most usually found in so-called 'free' improvisation and, while it can be highly stylised, is not usually tied to representing an idiomatic identity" (Bailey, 1993, p. xi).

within the improvisational process and is understood in terms of location, time frame and collaboration. Furthermore, the performers' idiosyncratic rhythmic, melodic, timbral, textural and gestural vocabulary gives form to spontaneously emerging structures. These can, retrospectively, be understood as compositional. Creative work which draws upon improvisation, field recording and electroacoustic composition often aligns with the sonic art genre, which some musicians, commentators and even practitioners do not consider to be music at all. However, Dunn claims that so-called sonic art is "a logical consequence of an evolution in musical practice rather than a break with it. If music in anyway [sic] reflects the evolving human condition, then we are probably right on target. This is what we should expect music to become in the 21st century" (Dunn, 2001).

2.2 My soundscape composition

Composition and performance are interdependent parts of my soundscape composition, rather than differentiated parts of a process in which one precedes the other. It is therefore necessary to understand my creative processes in terms of *prescription*, *spontaneity* and *retrospection*. I explore how these elements apply to the three developmental phases of my compositions: context, field work and editing.

The first phase covers one or more of the contextual elements, these being location, time, collaboration and strategy. Context can be prescriptive when strategy is informed by previous experiences or by expectations that I may have; for example, visiting a particular place at a particular time in order to engage an anticipated acoustic event. Even when certain contextual elements are prescribed, others can be spontaneous; for example, when serendipity presents a compelling recording location.

The second phase is that of direct engagement with the location, primarily through field recording and sometimes also through acoustic intervention using musical instruments. This engagement is necessarily intuitive and spontaneous; for example, when I am playing a musical instrument I may respond to a perceived tonal centre or to echoes reflected by the location's geography. Being prepared for a change in strategy, or more colloquially 'to expect the unexpected', is important because working in outdoor locations can, and often does, present unforeseen challenges, such as changing weather.

Sometimes extraordinary musical situations present themselves; thus serendipity can be the rule rather than the exception.

The third phase represents a process of editing in which I use electroacoustic technology to retrospectively refine field recordings by further exploring my musical, emotional and physiological responses to them. Sometimes this is as simple as creating a temporal frame around a part of the recording in which I perceive a finished work. Other interventions, whether spontaneous, experimental, prescribed or methodical, can distort or enhance acoustic phenomena, thereby revealing different ways of perceiving the soundscape. For example, slowing down a particularly complex sound can reveal spectral details which could not otherwise have been heard. During this phase I consider ways in which the composition might be presented; except when a particular diffusion location or duration had been prescribed.

My works can be identified in three different ways:

1. Hyper-real: when multiple selections recorded from different spatial and temporal perspectives are seamlessly combined, sometimes distorted but most importantly exaggerated.
2. Soundwalk: when my acoustic presence as a recordist leads a compositional narrative using a moving microphone.
3. Instrumental performance: when musical instruments or found objects become soundscape elements and are spatially composed in relation to a stationary microphone.

Now that the practicalities of my soundscape composition have been discussed, it is necessary to define soundscape and to explore its elements.

2.3 The soundscape and its elements

The term soundscape was coined by Murray Schafer in his book *Tuning of the World* (1977). He defines it as “any portion of the sonic environment regarded as a field of study” (Schafer, 1993, p. 274). Recently, soundscape has been defined more specifically as “the collection of biological, geophysical and anthropogenic sounds that emanate from a landscape and which vary over space and time reflecting

important ecosystem processes and human activities" (Pijanowski, Farina, Gage, Dumyahn, & Krause, 2011, p. 1214).

Prior to Schafer, traditional methodology for the study of environmental sound was characterised by the deconstruction of sounds from individual species abstracted from their sonic environments. In response to his perception of a gap in this methodology, Schafer developed a more encompassing concept. This opened up the field for further studies into soundscapes, from multiple disciplines which include biology, computational mathematics, physics, anthropology, music, natural history, environmental studies, resource management, sociology, medicine, geographic information systems, psychology, communications, philosophy, literature, business and architecture. This in turn necessitated the development of terms used to describe as yet unexplored sonic phenomena. These terms used to classify soundscape components according to their physical sources, namely biophony, geophony and anthrophony, are practical and succinct.

2.3.1 Biophony

Bernie Krause, musician and bio-acoustician, conceived the term biophony to describe the combined sounds of non-human living organisms in any given biome (Krause B. , 2002, p. 20). Krause later posits that pre-historical biophony constitutes an original 'proto orchestra' (Krause B. , 2012, pp. 82-105). Spectrogram analyses of recordings made in ecologically healthy habitats, show that the sounds of individual species have their own temporal and pitch spaces, much like those depicted on a graphic music score on which each acoustic event can be clearly discerned.

During 2001-2002 Krause took part in a study with entomologist Stuart Gage in order to consider the following additional terms to describe and categorise other, non-biological elements of a soundscape (Krause B. , 2008, pp. 73-80).

2.3.2 Geophony

Geophony refers to sound emanating from atmospheric and geomorphological sources: for example, thunder, wind, ice and water acting on one another and on rocks and vegetation; also seismic activity and volcanism.

2.3.3 Anthrophony

Anthrophony refers to sounds caused by humans. The potential for human sound to be a disruptive force in soundscapes has long been understood by non-industrial cultures, whose lifestyle, livelihood and communication might depend on the sonic integrity of their environments. There are four types of sound in this category:

1. Physiological sound, which emanates directly from the human body as speech, breathing and involuntary bodily function. This is the least obtrusive category of anthrophony, especially when people are aware of their acoustic surroundings.
2. Incidental sound, which includes those of walking or of rustling clothes. These may create a sense of presence likely to disturb only the most sensitive organisms.
3. Controlled sound, which is invoked for its own sake and includes musical performance, cinema and transmitted media. This category of sound becomes problematic only when extreme levels of sound are issuing; for example, from some car entertainment systems.
4. Electromechanical sound, whose sources include heavy machinery, aviation, motor vehicles and sirens. Sound sources in this group are generally the most intrusive. Electromechanical sound from marine craft and military communication technology, which, in part because of the great distances sound can travel through water causes significant damage to marine life (Stocker, 2002/2003). Few places in the world are free from the sound from jet aircraft; low altitude military aircraft can produce levels of sound pressure lethal to certain biological organisms (Krause B. , 2002, pp. 27-31).

2.4 Categorising sounds

The terms biophony, geophony and anthrophony are referential; they describe soundscape components specifically in relation to their sources in an environmental context. However, there are many other contexts in which sounds can be categorised and these may also overlap; for example, musical, linguistic, medical, military, forensic, psychological and technological. I explore in particular the categorisation systems of acoustic ecology and sound design together with a system of my own. These

categories, being broad, flexible and practical, are readily applicable, both in the field and during editing, to describing and engaging with environmental sounds in ways which can be spontaneous and unpredictable.

2.4.1 Acoustic ecology

Murray Schafer, composer and acoustic ecologist devised a system suited to describing soundscapes from social and historical perspectives (Schafer, 1993, pp. 9-10). Schafer had already founded the World Soundscape Project[8] during the early 1970's, this being an education and research group which first drew attention to the fragility of the sonic environment. I outline the three categories in Schafer's system: keynote sounds, signals and soundmarks.

Keynote sounds (or keynotes)

The term keynote sound is analogous to the keynote of tonal music as an underlying constant around which other soundscape elements or musical material may modulate or even obscure. Keynotes may not be overtly acknowledged as important carriers of information but nevertheless influence the lifestyle and cultural dynamics of a community, for example, sounds that are ubiquitous in a particular settlement such as those produced by wind, the ocean or industry.

Signals

Signals represent particular and familiar sonic events providing tactical cues, such as a ringing phone or the sound of a vehicle approaching which is recognised. Signals can emerge from keynote sounds, for example, the sound of a storm developing from a previously calm sea.

Soundmarks

The term soundmark is derived from the term landmark and refers to community sounds with qualities that make them specially regarded as distinctive natural or cultural phenomena; for example, the sounds

[8] The World Soundscape Project page can be accessed through the Simon Fraser University website at http://www.sfu.ca/~truax/wsp.html

produced by an endemic species, or church bells from a particular village. Soundmarks can also function as signals, for example the distinctive chiming of a clock tower.

2.4.2 Sound design for documentary and film

The following definitions represent my understanding of sound recordist Chris Watson's description of how soundscape components in documentary, film, radio, television and video games, are defined and applied[9]. Watson's sound design categories are focused sound, habitats and atmospheres, each of these involving concomitant recording techniques and post-production values which require acoustic invisibility of the recording process. For example, physiological or incidental sounds resulting from breathing or handling of equipment, together with sounds produced by wind or moisture interacting with microphones, are unacceptable.

Focused sound (or species sound)

Focused sound recordings feature single sources such as speech or individual animal sounds. These are necessarily recorded in ways which exclude other environmental sounds as much as possible, often by using a directional, monaural microphone system at close range. In post-production, focussed sounds are foregrounded against separate recordings of 'atmospheres' or music. Foley artists often record focused sounds in acoustically isolated environments such as studios; these become sound objects to be manipulated, re-contextualised and distorted in order to produce particular sound effects, both realistic and imaginary.

Atmospheres

Atmospheres refer to the constant background ambience of a location, which can sometimes include keynote sounds. The sub-category 'Wild tracks' represents outdoor atmospheres; for example, the sounds produced by wind, rain, traffic in the city, or distant industrial activity. The other sub-category 'Room tones' represent indoor atmospheres; for example, sounds generated by ventilation systems or

[9] In 2010 I attended a wildlife sound recording course with Chris Watson at the Wildeye international School of Wildlife Film-making, in Reepham, Norfolk, UK.

engine sounds when they are heard from inside a vehicle. All atmospheres have a small dynamic range, feature only background sources and are often mixed behind focused sound.

Habitats

Habitats feature more dynamic spectral, spatial and intensity ranges than atmospheres and do not necessarily function as backgrounds to other sounds. By representing the entire soundscape, habitats can encompass many organisms (or people) interacting within a specified area. Habitat recordings convey the spatial positions of sound sources together with the resonant characteristics of the location.

2.4.3 Categories for soundscape composition

The acoustic ecologist's categorisation system provides an axis for discussing how soundscape elements can be perceived from perspectives relating to places and people. My experimentation with recording techniques used by sound designers, although rejecting associated production values, nevertheless reveals ways in which spatial and temporal soundscape elements can be engaged. This experimentation is highlighted when I discuss my works in Part II.

To be clear, my compositions do not necessarily focus on social contexts, nor are they intended for use as wild tracks or sound effects. Nevertheless, together with Krause's referential categories, those from acoustic ecology and sound design provide a basis for exploring soundscape composition. Furthermore, they define a space in which I develop my own theoretical terms, as follows.

Micro-sounds

A micro-sound is characterised by its very low amplitude and is therefore audible only within a short distance from its source, for example, a trickle of water. Micro-sounds are easily dominated by other sounds but can be foregrounded by recording them from a location close to their source. When micro-sounds are perceived in this way one can perceive their sources as being 'larger than life'.

Macro-sounds

Macro-sounds have sufficient acoustic energy to distinctively activate resonant features of their surrounding environment. They usually emanate from single sources, for example biological organisms

or musical instruments, and can compete and interact with one another. Macro-sounds can be keynotes, signals or soundmarks. A particular macro-sound can be foregrounded by recording it from a location close to its source or if recording in mono, by using a directional microphone from further away. Such sounds can become a part of the ambience when their sources are distant.

Whether a sound is considered to be micro or macro depends not only on its proximity to the microphone, but also on other soundscape elements; for example, dripping water in the quiet of a resonant cave may be considered macro, but in a noisy bush environment would probably be micro.

Ambience/Integrated sound

Ambience encompasses the entire soundscape but is not necessarily background. It must be recorded with a spatial microphone system, for example AB, XY or mid-side[10] because spatial perception is crucial when sound sources move, when multiple sounds combine or interact, or when the microphone is being moved. Ambience includes any reverberant or echoing characteristics of the location.

Micro-sounds, macro-sounds and ambience relate specifically to the practicalities of soundscape composition. They assist in discussing how the acoustic and spatial characteristics of multiple sound sources, together with the location's resonant characteristics, can be perceived through the microphone. They also assist in discussing how focus may be given to specific moving or stationary sounds.

Now that categories relating to soundscape elements have been defined, it is necessary to explore concepts relating to perception through listening.

[10] These stereo microphone techniques are described on the *DPA Microphone University* website. http://www.dpamicrophones.com/en/Mic-University/StereoTechniques.aspx (DPA Microphones, 2008).

3 The listening subject

As Chris Watson observes, environmental sound and music can both be appreciated in the same way, depending on how we choose to perceive them:

> What I like to do, even if I don't have any recording equipment, is go out somewhere, stand there, and listen. Because our world is far more interesting and intriguing and fascinating sonically when you can stand and absorb, and listen to sound or music. I don't discriminate between the two—because the world is a far more interesting place when you can tune in and do that (Watson, cited in The Colour of Sound).

Just as we create meaning from the sounds we hear in a musical performance, a radio programme, or even in our imagination, so also, environmental sound offers equal potential to create meaning. Composer and sonic sculptor Bill Fontana expresses a similar view:

> I started having these experiences, I would be somewhere, and the everyday sounds suddenly seemed as interesting to me as the sounds of any music I could hear inside the concert hall. They just seemed so rich that I wanted to document moments of listening. I came to regard the act of listening as a way of making music. I regarded it as a creative activity—finding music in the environment around me (Fontana, cited in Wyse, 2010).

But how does this 'finding music in the environment around us' occur and how can it be considered creative?

While hearing is a physiological function, listening is necessarily attentional, fundamentally instinctual yet capable of being developed and controlled. When discussing soundscape composition, whose generative processes employ listening in many different contexts, it is helpful to explore ways in which different parts of the soundscape can be perceived, particularly in relation to their sources, their ecologies, their spatial specificities and their musical characteristics.

In *Listening: Modes and Strategies* (2012) composer Steven Miller describes, compares and contrasts listening modes and strategies conceived by practitioners from various disciplines: Barry Truax (acoustic ecology); Michel Chion (sound in film); and William Moylan (studio mixing and production). Miller shows that there is much overlap between these concepts; he concludes that they are

complimentary and none of them exclusive. My own observations, together with some of Miller's, focus on various theoretical positions, these providing a platform on which to discuss listening in the context of my creative work.

3.1 Foreground to background

Acoustic ecologist, composer and writer Barry Truax describes three levels of listening attention described in historical 'earwitness' accounts (2001, pp. 19-27). These levels are *foreground listening*, *listening in readiness* and *background listening* and are invoked by circumstances relating to particular contexts and sounds. I now describe these levels, provide examples and assess their place in soundscape composition:

Foreground listening or listening in search takes place when one's full attention is focused on a specific sound. This analytical level of attention is applicable when searching for tactical cues; these may be prompted by nuances and subtle changes in the sounds on which we are focusing. This highly selective listening strategy also allows us to filter out sounds perceived as redundant, even when their sources are more proximate; for example, when we follow a conversation taking place beyond our immediate surroundings. Many blind people learn to refine their foreground listening in ways enabling them to safely navigate changing environments, using their cane as a sound source for echolocation, and by analysing the properties of sound reflected from surrounding objects. In terms of both delay and direction, the proximity and location of objects can be deduced and the timbral colouring of this reflected sound may indicate what these objects are, for example shrubs, walls, parked cars, fences or other pedestrians. For musicians, foreground listening focusing on timbre, pitch and rhythm, is essential for musical dialogue.

Listening in readiness describes an intermediate level of acoustic alertness and is based upon patterns of association built up over time. When we are listening in this way certain sounds may prompt a response as they start, stop or change, even if our attention is directed elsewhere. For example, a signal such as knocking on the door will prompt a response and may in addition convey, through rhythmic and dynamic contours, clues as to the visitor's identity or purpose. The sound of a child crying at night

signals to the parents, through its pitch, duration, timbre and volume, the reason for the crying, even when other sounds do not wake them. Conversely, a sound that is already present may change in a such a way that demands our attention, for example, a driver shifting gear in response to a particular change in pitch of their car's engine. 'Listening in readiness' often prompts serendipitous soundscape composition when unexpected acoustic phenomena are recognised as being compelling.

Background listening is a passive level of listening which takes place when familiar sounds, especially keynotes, register subconsciously but are not necessarily assigned a particular meaning prompting a tactical response. Sounds such as an electrical hum, wind, rain, traffic, footsteps, or a neighbour's appliance, can all constitute background listening, yet evoke feelings such as comfort or irritation. Some sounds are imposed specifically for background listening, for example, piped music in a shopping mall. This is to encourage particular types of behaviour or to mask other sounds which are distracting. Some of my pieces re-contextualise sounds that may otherwise have been the subject of background listening, into the foreground.

When using the terms 'foreground' and 'background', it is important to distinguish between the spatial proximity of a sound's source and one's listening focus; the listening subject can sometimes perceive particular sounds as being in the foreground even when their sources are distant and their spectral characteristics filtered. This can typically occur when one listens in on a conversation which is taking place across a noisy room. I can recall a more profound example: When I was a music student flatting in Sydney I remember lying in one morning and listening to Miles Davis's 1969 record *In a Silent Way*, which somebody else was playing in another part of the house. Although I was familiar with the record at this time, its yearning melodies and hypnotic rhythms seemed to speak to me in a new way, in spite of it emanating from several rooms away. Not that it sounded 'better' than it had before, on the contrary this would not normally be an ideal way to listen to a record, but this particular context allowed me to better understand *In a Silent Way*. It may have been a combination of my unhurried state of mind and my undivided attention to a sound whose spectral fidelity was only partially perceptible, but whose musical essence was strong enough to be conveyed through it.

3.2 Causal listening, semantic listening and reduced listening

The listening strategies described by Michel Chion in *Audio-Vision: Sound on Screen* (1994, pp. 24-33) can occur either alone or concurrently and are focused towards individual sounds. These modes span the continuum between the referential and the abstract.

Causal listening focuses on a sound's source or cause, which can be either familiar or unknown. Such listening comes into play as a tactical tool when the soundscape composer engages with a particular sound source, for example, when field work is planned to coincide with a biophonic event occurring at an expected time.

Semantic listening focuses on sounds at communicative levels, such as verbal, musical or coded and therefore, necessitates familiarity with their particular patterns and meanings. When musical performances or speech feature in my compositions, semantic listening occurs when musical or linguistic material is identified.

Reduced listening focuses on the complete abstraction of sounds from any referential context. In order for a sound to become *l'objet sonore,* it must first be 'fixed' or de-contextualised, by recording it.

3.3 Profound listening

As a listener I am drawn towards any soundscape which prompts exploration and engagement, or which invokes cognitive and emotional responses. Francisco López (1998) claims that this 'profound listening' calls for a non-representational yet transparent relationship between sounds and their environments, and it is this relationship I explore in my soundscape compositions. Ways in which different listening levels, modes and strategies can apply to profound listening are subject to their contexts of environment, culture and of the individual listening subject.

> When listening to sounds we can choose to focus on the perceptual qualities of the sounds, or on the meanings that the sounds convey. Of course, the situation is usually much more fluid than this simple 'this or that' dichotomy; we usually transition rather seamlessly between attentional strategies to shift focus between any number of aspects of the sonic experience. Perceptual qualities are only the most obvious layer of sounds, but are also often the most easily ignored. Other qualities may include semantic, syntactic, contextual, and/or

> symbolic meanings conveyed by the sounds. In terms of a communicational experience of sound, these 'other' qualities tend to play a more prominent role (Miller S. M., 2012).

Soundscape composition presents the possibility of encompassing both the referential and the abstract, by allowing the simultaneous perception of sounds in more than one context, also by intentional manipulation of these contexts.

3.4 Noise pollution, aural desensitisation and relative silence

Over the last 150 years, human listening strategies have had to adapt to acoustically dense urban environments and to an increasingly visually orientated culture. Krause identifies increasing levels of noise pollution from industry and commerce as threatening our wellbeing as well as that of wild eco-systems, both physiologically and socially (Krause B. , 2012, pp. 155-200).

> In 1968, when I first began my odyssey, I could record for about 15 hours and capture about one hour of useable sound on my equipment. A ratio of about 15:1. Now it takes nearly 2000 hours to record one hour. Why the change? There are several reasons. The most serious, of course, is the unimaginable loss of representative habitats. The second is the increase of human mechanical noise which tends to mask the subtle aural textures of the remaining environments. And the third—as a direct result of the first two issues—is the decrease in certain key vocal creatures, both large and small, that make up typical natural soundscapes (Krause B. , 2001).

More than ten years ago, Krause disclosed that nearly half of the soundscapes he had recorded over the previous 33 years no longer existed, this being the result of acoustic and ecological damage. Thus the relative health and biological condition of an ecosystem may be assessed by analysing its biophony.

The acoustic onslaught of urbanisation is reconfiguring our relationship with the sonic environment; today most people live and work in a world bombarded by the sounds of transport, industry, mass media and high density population. As urbanisation increases, so does the density and amplitude of anthropogenic sound, thus masking sounds which had hitherto functioned as important cultural and ecological keynotes, signals and soundmarks. This shift marks a departure from a stage in the evolution of our auditory system which had adapted to detect minute changes in our acoustic surroundings. Acoustic communication in contemporary urban soundscapes can be challenging, even impossible, for instance in bars and nightclubs whose soundscapes are specifically designed to inhibit acoustic

communication. Even the telephone, originally designed to facilitate the transfer of sound over distance, now functions largely in the visual realm; people email, take photographs and engage in social networking rather than speaking to each other. It is interesting to observe how these changing sensitivities in our auditory systems have affected our awareness and behaviour in 'high-fidelity'[11] soundscapes, such as well-designed urban or healthy wild locations.

One such opportunity presented itself to me at Minneriya Wildlife Sanctuary in Sri Lanka, where I took an elephant safari in 2011, naively anticipating that an expedition into the wilderness would provide an opportunity to listen to a herd of elephants in their own territory. I recount my reflections during that time:

> Because our guide was not at liberty to take us off the main circuit to a remote location, we were in a queue of at least twenty other jeeps, whose drivers, even while pausing for the excited tourists to take photographs of the spectacular scenery and wildlife, kept their engines running. This level of sonic interference masked most of the 'natural' soundscape, which may have been equally unique and spectacular to the sights everybody was enjoying. The only sonic interaction with the place was when several of the drivers (to the delight of the other tourists) provoked the elephants into stamping, flapping, trumpeting and finally charging, by making multiple encroachments into their personal space, sometimes while they were surrounding their young. Our guide seemed pleased with himself, thinking that he had found us what we were looking for, shouting 'Sound! Sound!' (Excerpt from the composer's field diary, 2011).

Despite a sign saying 'silence is golden' at the park entrance, most of the tour guides did not stop their engines at any time. It seems that our acoustic awareness has become desensitised to the point that we cannot conceive how anthropogenic sound, ubiquitous to urban environments, can be profoundly intrusive in others. Because we are accustomed to acoustically compromised environments, we don't always engage those listening processes that can convey much about our surroundings. This tendency to dismiss sounds which do not provide obvious tactical cues is a consequence of having to tolerate 'low-fidelity' environments, in which such sounds are easily overpowered. In the account given above,

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[11] In a 'high-fidelity' environment, most sounds may be perceived in detail and their sources located, allowing positive acoustic communication to occur. By contrast in a 'low-fidelity' environment, broadband noise masks acoustic communication and makes some sound sources difficult to locate (Truax, Acoustic Communication, pp. 23-24).

it was deemed necessary to make some extreme physical and sonic provocation in order to produce a sound worth hearing.

Chris Watson describes typical urban environments and how they have affected our listening behaviour:

> We are bombarded by sound and noise, day and night. Our senses are de-tuned to the effect that we filter out so much information simply to concentrate on whatever we're doing at the time […] we hear everything, but we rarely have the chance to listen to any particular individual thing (Watson, cited in The Colour of Sound).

When a decision has been made, habitually or deliberately, to repudiate particular sounds, this process of 'filtering out' can be understood as a type of silencing.

Different ways of conceptualising 'silence' are discussed by George Foy in *Zero Decibels: The Quest for Absolute Silence* (2010). Here Foy describes how "some cultures, such as the Japanese, implicitly reject the idea of absolute silence. Instead, for them, silence means a relative quiet that includes important aspects of the world as they experience it or wish to" (Foy, 2010, p. 117). Foy offers an anecdote about a public gathering in Tokyo, where people came to 'listen to' the (in fact inaudible) blooming of a lotus flower, exemplifying how, in a culture which regards high emotion as being "beyond the grasp of words", observation of silence is understood as being a synaesthesia of all sensations.

Watson offers his perspective on why we should endeavour to engage with our acoustic environments:

> Listening in a positive way, that is, actively taking the decision to focus on certain things and reject others is a very positive and creative thing to do in that it […] actually stimulates my thought processing—makes me think, perhaps more laterally, about problem solving or how I can achieve creative output for something. It makes me think in a different way; that's why I find it so satisfying (Watson, cited in The Colour of Sound).

As positive, active listeners we are able to determine how we engage with our acoustic environments and as soundscape composers, we can also manipulate them.

3.5 Creating our own sonic realities

A valid criticism of 'nature recordings' is directed at their potential to indulge an idealistic notion of 'wilderness', one in which all traces of humanity are absent. As Krause has alerted us, the extent to

which human activity, especially noise pollution, is encroaching on such fragile habitats, is profound. Certainly, such recordings can provide crucial data for environmental science and be used to educate the public. However, paradoxically when these recordings are marketed as being 'pure', 'natural', 'un-edited' and 'relaxing', there is a danger that the consumer may not understand them to be an illusion. To quote David Michael, "The aesthetics of nature recording are steeped in fantasy. This fantasy is one in which our ecosystems are healthy and the internal combustion engine does not exist." (Michael, 2011, p. 207). David Dunn offers a similar criticism of such recordings:

> When you're making a sound recording, you're not preserving anything except an illusion. It's a technological projection, a construction that is no more real than if I was to make a drawing of that location. There's nothing real being preserved. It's a flattening out of the complexity of an acoustic environment. It's just sounds that ultimately are energy patterns that have been put onto a storage medium, so that we can later make a loudspeaker cone move in space […] Most of the time, what you hear in these recordings is someone who sat long enough between periods of airplanes and cars passing that they can get something that appears to be a pristine recording. To put that forth as the reality is a lie (Dunn, 1999).

This leads to the question, 'what might a sonic reality sound like?' Francisco López states, "our idea of the sonic reality, even our fantasy about it, is the sonic reality each one of us has" (López, 1998). Here López is implying that there is no such thing as an authentic sonic experience but instead a strong perception of convergence between reality and authenticity. Our ideas surrounding authenticity are shaped by sounds we have already heard, both in and out of particular contexts. We often hear sounds that seem to be out of their environmental context; for example, the sounds of aircraft when hiking in the mountains or a phone interrupting a concert. Such sounds are not considered authentic to the environments in which they occur and therefore a nuisance. However, I argue that the tensions created by these sounds with their contexts, are crucial in understanding how sonic realities emerge. If a nature recording aesthetic is based on the exclusion of sounds which are part of the reality the recording cannot be considered authentic.

Although I am sometimes drawn to locations which have minimal human presence, I operate within an aesthetic that encompasses all soundscape categories. In this way aspects of the entire sound world can be appreciated through engagement both in the field and in the studio, making soundscape composition

a compelling mode of musical expression. Such interventions can extend listening by allowing particular acoustic elements to be enhanced, foregrounded or distorted, thereby enabling the creation and communication of my own sonic realities.

4 The acoustic agent

> In a very real sense, we are all aural architects. We function as aural architects when we select a seat at a restaurant, organise a living space, or position loudspeakers (Blesser & Salter, 2007, p. 6).

The works featured in this research are expressions of spaces which are acoustically 'illuminated' by sounds emanating from both within and around them, rather than formal compositions in which specific acoustic materials have been extracted for their spectral characteristics alone. The locations featured in these works are explored through direct engagement by the composer, who acts as both listening subject and acoustic agent. Experimental microphone techniques such as use of extreme perspective and sound walking are employed in order to convey the visceral characteristics of sound sources in their environments, all the while charting a zone between the referential and the abstract.

4.1 The microphone as a musical instrument

Chris Watson describes how his microphones allow him to listen to sounds occurring deep amongst grasses growing near the sea:

> It's fantastic to be able to drop the microphones in and just listen to what's happening down here—sounds that are around our feet every day that you ignore, that you step through, you walk over—and just don't have a chance to listen to properly (Watson, cited in The Colour of Sound).

When one searches for music in the environment, listening becomes a creative activity. Sounds which might have been the focus of background listening or listening in readiness can then become the focus of foreground listening; thus the soundscape's ecology is temporarily re-configured. Like the lens of a camera, microscope or telescope, the microphone is to a contrivance used to enhance or distort one's perception of specific parts of our sensory environment. Conveying soundscapes through a particular microphone configuration (or distortion process) can help the listener to perceive those sounds, otherwise perceived as keynotes, signals and soundmarks, in different ways. The microphone can then be likened to a conventional musical instrument in that it represents an idiosyncratic acoustic contrivance to be negotiated by a performer. These idiosyncrasies vary profoundly between different

microphone types, thus affecting how the recorded soundscape is perceived. Several different microphones were used to record this body of work, these changing as I was able to upgrade them.

A distinctly performative element of my field recording comes into play when I traverse the soundscape with the microphone. Because this is primarily a process of discovery, it is necessarily spontaneous, even when a particular route has been proposed. When the moving microphone technique is used, I consider the inevitable presence, in the recording, of my own physiological and incidental sounds (such as speech, footsteps, equipment handling and breathing), to be important soundscape elements, rather than undesirable technical artefacts. Such sounds can later on, during editing, provide musical cues and even become a spectral focal point.

When the microphone is considered to be a musical instrument, field recording must be attended to through profound listening in order to encompass all listening strategies, thereby setting in motion a sequence of musical decisions which is sustained throughout the editing phase of soundscape composition.

4.2 The musical instrument as a listening device

A way of making music that draws upon performers' physiological engagement with place, together with their emotional relationship to it, is described by Jim Denley:

> This engaging through sound is instantly understood by those who attempt to know the place—perhaps this has always been one of the major functions of music. Just as birds delight in space through sound, there is a delight in finding appropriate human sounds to resonate in space. Inherent in this is a deep listening to the space. This complex activity defies easy analysis—it doesn't begin with thoughts, but with our body's engagement with place (Denley, 2009).

In *Where Rivers and Mountains Sing*, Theodore Levin describes a similar but somewhat metaphysical way in which place is conceived by traditional Mongolian musicians:

> Any naturally reverberant acoustic space and the spirits that dwelled there could be animated by the physical stimulus of sound. Cliffs, valleys, forests and mountains are all imbued with the power to resonate—indeed to sing—in response to sounds made by humans as well as wind, birds and animals (Levin, 2006, p. 37).

An appreciation of ways in which acoustic space has been interpreted historically and by different cultures allows one to engage with place by imagining that a musical dialogue with it is possible. At the same time, a modern theoretical understanding of acoustic space allows the soundscape composer to use recording technology in order to design their own acoustic architecture. By contemplating such different understandings of acoustic space, the soundscape composer can conceive places as being musical instruments, which are played by acoustically illuminating them.

> Cultural values convert physical phenomena into experiential phenomena. The history of aural experience is therefore the progressive change in the nature of this conversion—from the mystical religion of prehistoric tribal shamans to the rational explanations of modern acoustic and perceptual scientists (Blesser & Salter, 2007, p. 70).

A significant factor in the evolution of many western musical traditions has been the acoustic architecture of the environments in which they are presented. Conversely, the acoustic architecture of concert halls, auditoriums and studios has evolved alongside the musical genres it presents. So crucial are the acoustic characteristics of such places, that they might be regarded as musical instruments themselves, whose construction considers every acoustic aspect, including their spatial dimensions, how their surfaces reflect or absorb sound and how humidity and temperature can be regulated. This is an acoustic aesthetic that focuses on musical instruments as sound objects and in turn on the compositional strategy of the composer. In such contexts the element of place can therefore be considered ultimately as a means by which to present compositional strategies.

By contrast, in my soundscape compositions place is foregrounded and compositional strategy is considered to be an artefact of creative engagement. My rationale for using musical instruments is to become acoustically intertwined with the location by finding my own sounds with which to acoustically illuminate its space and co-exist with other environmental sounds. The acoustic characteristics of such places I engage are often transitory and are not necessarily associated with any particular musical aesthetic. Such ephemeral contexts provide opportunities for the listener, through the performer, to perceive soundscapes in ways that they may not at other times do. Therefore, utilising prescribed

musical content, written or improvised, would contradict the entire point of soundscape composition, in which the performer's role is to listen and make sound if and when it feels right.

Francisco López describes how a place can be perceived through acoustic illumination:

> […] a sound environment is the consequence not only of all its sound-producing components, but also of all its sound-transmitting and sound-modifying elements. The birdsong we hear in the forest is as much a consequence of the trees or the forest floor as it is of the bird. If we listen attentively, the topography, the degree of humidity of the air, the type of materials in the topsoil become as essential and defining of the sonic environment as the sound-producing animals that inhabit a certain space (López, Environmental Sound Matter, 1998).

Of equal importance to a sound's source is the resonance of the space it inhabits. This resonance is characterised by environmental elements such as geography, vegetation, humidity, temperature, wind speed and wind direction, distinctly colouring it by affecting the distance and speed at which sound travels and how it is absorbed or reflected. Different ways of understanding this process of acoustic illumination are crucial to soundscape composition. When using musical instruments to acoustically illuminate space, the bio-feedback loop described by saxophonist Evan Parker in Fred Hopkins' documentary *Amplified Gesture,* comes to mind:

> I made the analogy a few years ago in an interview with bio-feedback and—you couple yourself to that instrument and it teaches you, as much as you tell it what to do—So if you're sensitive to how the instrument is responding to your efforts to control it—By hearing the way it's feeding back to you, you learn to control it better. It's a very dynamic and very sensitive process. Obviously you have to have some kind of goal, something you are trying to do—when practising, that can be a very specific thing […] you're refining your sense of pitch, the accuracy of your timing, all of these things. And the instrument at the same time seems to be giving you additional information. So there are things that you have under your control, but every so often something will go wrong; you'll lose control but in that moment you're given an opportunity to learn something else that the instrument can do. So that sounds very nebulous—let's give a specific example: you brush a key unintentionally and the column is broken for a moment in a place where you didn't intend it to be broken and as a consequence instead of the fundamental note being produced you may produce an overtone of that note, so you then try to bring that accidental thing under control—'What was that? What did I just do? Why did the instrument just do that?' So there are many ways in which this notion of bio-feedback occurs […] let's say the saxophone has a destiny, has a will and a set of intentions in its relationship with you and you start to find it difficult to distinguish yourself and your intentions from the instruments intentions. Well, let's say that I've found it difficult to do that (Parker, cited in Hopkins, 1999).

Such bio-feedback processes are integral to meta-music when the musical instrument itself is considered to be an agent in the music-making. I consider the contextual element of the space into which sound is being projected to also be a part of this bio-feedback loop.

Collaboration is a further contextual element that is sometimes important in soundscape composition.

4.3 Collaboration

Collaboration is important to most of my soundscape compositions, in that many of my field trips involve another person or people. I consider anyone accompanying me on a field trip to be a collaborator because by default, they are part of the recorded environment. For such collaboration to be a success it is essential that all involved understand and appreciate the process and are willing to become a part of it. Reasons for collaboration include my requiring assistance with travel or carrying equipment and my calling upon guidance from someone who knows the location well. Some collaborators also happen to be improvisers, whose presence in the recorded environment might be foregrounded. Some of my early collaborative experiences during *Outdoor Studio* were problematic because the concept of acoustic illumination was not fully understood by any of us.

4.4 Constructing an acousmatic soundscape composition

The digital audio workstation (DAW) provides the tools with which my field recordings are edited into cohesive musical works. During this phase of soundscape composition, I use the DAW to scrutinise and enhance my field recordings by exploring different editing and filtering processes. The DAW is also used to modify finished works to suit particular contexts for their subsequent diffusion or used to make real-time acoustic adjustments when presenting works to an audience. Due to my pre-existing familiarity with its interface and features, the DAW used in this body of work is *Cubase 5*. However, other DAW's could have been used to achieve the same results.

As my recordings were played back through the DAW, preliminary adjustments could be made to gain, dynamics and equalisation in order to enhance particular acoustic characteristics. For example, the frequency response curve of the DPA 4060 microphones I had used in some of my fieldwork, features

a boost of about 3dB between 5 and 10 kHz. This gives their recorded sound a bright, airy and sometimes even brittle characteristic. When necessary, the DAW allowed me to attenuate this particular frequency range, thereby achieving a more neutral or dark sound. Other technical issues were also addressed during this initial playback stage; for example, excessive infra-sonic interference that had been caused by wind could be reduced by applying a high-pass filter at a point between 20 and 60Hz. When a section within a recording was perceived as an already finished soundscape composition, the only necessary interventions were to create a temporal frame around it by defining start and finish cues in the DAW and preparing it for diffusion. Sometimes such sections were not identified until even more than a year after my field work; this I attribute to my having, by then, a fresh perspective on the recording. Other compositions evolved through a process of experimentation in which recordings were fragmented, combined, amplified, compressed or equalised. Many of my recordings do not constitute completed works but are nevertheless of value as experimental artefacts and personal histories of listening.

4.4.1 Manipulating perspective

My soundscape compositions perceive perspective in spatial and temporal contexts. These perspectives can be manipulated; for example, recordings made from different locations or at different times can be combined in order to present contrasting perspectives together in a composition. Other ways in which perspective can be manipulated include the slowing down of a recording in order to expose pitches and rhythms that were hitherto beyond the scope of normal human hearing, also removing segments from a recording in order to temporally condense a sequence of events. By re-contextualising parts of a soundscape through such manipulation, it can be perceived in ways not possible in the field.

A further, inevitable and profound shift in perspective occurs every time my soundscape compositions are played back. This shift can be highly unpredictable in nature because it is defined by the context of diffusion in which audience, location and the loudspeaker system all play a part.

4.5 Diffusion

All musicians have to negotiate space, including those who use loudspeakers. Composer Michael Chion describes this challenge:

> Recordings and their sound sources (combined with their spatial characteristics) are heard through […] loudspeakers. The loudspeakers themselves are placed in, and interact with, a playback environment—such as a living room or automobile. The playback environment is nearly always quite unrelated to the spaces on the recording. Thus, the listener ultimately perceives spatial characteristics applied to the sound source after they have been altered (Chion, 1994, p. 23).

Many commercial recordings are produced to be played back in environments that might have a high level of background noise and/or through low powered speaker systems (for example, those in transistor radios, smartphones and personal computers). One such environment is inside a car, where background noise from its engine and tyres presents a significant noise floor (85dB) which severely limits the dynamic range available for listening to music. In such an environment it is arguably not possible to properly listen to many recordings because their low to mid amplitude level sounds would be inaudible. Nevertheless, these are popular listening contexts and as such are a contributing factor to the tendency of recorded music, film soundtracks, radio and TV broadcasts, to be presented with a reduced dynamic range. By contrast, an important aspect of my soundscape compositions is their wide dynamic range, which necessitates their diffusion in quiet environments using suitable loudspeaker or headphone systems.

Part I has provided a nuanced understanding of soundscape composition through an examination of different approaches to improvisation and field recording, which are fundamental to it. Terms necessary for discussing theoretical and practical aspects of soundscape composition have been defined and different ways of perceiving and negotiating soundscapes from the perspective of both listening subject and acoustic agent, have been presented. The stage is now set for showing, in Part II, how the listening subject and the acoustic agent conspire to produce my own soundscape compositions.

Part II: Major works

5 Poranui: Sea voices

Poranui reveals the voices of the sea at a place otherwise known as Birdlings Flat. Because of its exclusive focus on sounds coming from the sea and also because of the ways in which these sounds have been re-contextualised, this composition can be appreciated in ways both referential and abstract. *Poranui* combines recordings made from different sites within the location using various recording techniques in order to choreograph its many voices in ways that convey their visceral power. In order for its dynamics to be experienced most fully, *Poranui* should be diffused at high volume.

Field trips were taken during the afternoons of 17th November, 2010, shortly after the high tide; 17th January, 2011, just before the high tide; and 2nd July, 2011, as the high tide was turning. The summer days were mild with light northerly breezes and the winter day was still and cool. Field recording during the first two visits focused on different spatial perspectives encompassing sounds coming from many sources. As selections were extracted from these recordings, variations in their timbre, texture, density and rhythm were further revealed; for example, from the perspective of the backshore, the infrasonic rumble produced by offshore waves is perceived as being more enveloping than it is from the perspective of the nearshore, where the sounds of individual waves breaking dominate the foreground. As these various selections were combined in different ways, a spatial narrative structure emerged in which the listener is transported from the backshore, across the foreshore and finally down into the crashing water and shifting pebbles on the nearshore. In order to achieve this illusion of spatial modulation, the various selections had to be seamlessly combined. The third field trip focussed on recording specific acoustic elements which I felt were required to complete the composition.

5.1 Location

Poranui is located in Canterbury, New Zealand between Christchurch and Akaroa at the place where Lake Forsyth enters the sea (see Map 1). Its main feature is the particularly hostile beach with a heavy swell and undercurrents that have claimed the lives of people attempting to swim or wander too far down its steep bank, which is hazardous because large waves can appear unexpectedly. The landscape

is harsh, bleak and exposed, the sound of the sea being always present and human activity limited to grazing stock and a small settlement of less than 200 people (see Map 2). Banks Peninsula can be seen to the North and East, Kaitorete Spit stretches 25 km to the West and to the South is the Pacific Ocean.

Map 1. Banks Peninsula, Canterbury. Birdlings Flat is marked with a red star. Source: Google Maps.

Map 2. Satellite image of Birdlings Flat showing the South Pacific Ocean, the beach, the settlement and Lake Forsyth. Source: Google Maps.

Photograph 1: The sea at Birdlings Flat, shown from the northern end of the beach. Photo: Chris Reddington.

The beach stretches from the settlement about 800m to the East where it reaches high cliffs. Walking slowly along the shingle one may discover washed up seaweed, driftwood and elephant fish eggs, along

with plastic waste, worn by the sea until it becomes part of the environment. The presence of the sea is relentless; even during calm weather its ominous power is felt through infra-sonic vibrations.

5.2 Acoustic elements

Poranui focuses on three fundamental natural elements; water, stone and air, which combine in different ways to produce many distinctive voices. From the backshore and a little way inland one can hear the distant, blurred keynote of water against water—thousands of tons falling in wave cycles, all along the beach and out to sea—producing a low frequency rumble. On the foreshore the wave cycles are more clearly defined and their dynamic churning and crashing dominates the middle frequency range. Along the nearshore the high frequency foaming, frothing and fizzing of salt water combining with air is heard; this occurs immediately after a wave breaks on the shore, its amplitude determined by the force of the swash. The sound of millions of bubbles bursting abruptly fades, giving way to the sound of pebbles being sucked down the beach by the backwash; this is characterised by a granular and resonant sweep, rising in pitch slightly as the pebbles accelerate. Particularly powerful waves plough these pebbles up the beach, propelling some into the air which then land on the beach with a short scattering sound.

With the exception of a chance lone seagull at 04:55, *Poranui* consists only of sounds produced by the sea. These sounds were recorded from many different positions; from beyond the backshore near the edge of the acoustic horizon, to within a metre of grinding pebbles and hissing foam at the nearshore. In the selections recorded below the tidal mark, the foaming water can be heard all around, a perspective that most visitors to Birdlings Flat would not experience because of associated discomfort and danger.

An early version of *Poranui* (January 2011) features Richard Nunns's conch playing on location, together with musical instruments I had made from objects found on the shore, including elephant fish egg capsules, dried seaweed and sea worn shotgun shells. These fragile sounding instruments were recorded indoors, but as I had anticipated, their presence in the piece sounded contrived because the continuity of locational context was prejudiced by the performance taking place in an entirely different environment. In particular the sound of these instruments was estranged by room resonance, which could not be eliminated even by recording them in mono at very close range. All of this confirmed my

conviction that performance must take place within the featured environment, because my work necessitates direct physical engagement with the location both as a listening subject and an acoustic agent. Although the locational recording of strident conch playing had been edited in a dramatic way which allowed the sea's power to overcome it, without other anthrophonic elements its brief presence was too sudden. I therefore decided to feature the voices of the location alone by focusing its eerie and inhospitable characteristics, thereby exposing the listener more directly to their intensity. Thus my presence as a listener, although not acoustically discernible, manifests through the compositional narrative.

5.3 Field recording

On the first two field trips a RØDE NT4 stereo microphone[12] mounted in a hand held windshield with a wind cover was used to record all sound sources, from locations beyond the backshore to the nearshore. The selections featuring the distant perspective were recorded from the car park as well as from the eastern foreshore, sometimes facing the cliffs in order to capture ambient sound reflected from them. Sounds occurring at the nearshore, produced by broken waves fizzing around my feet and then retreating across the pebbles, were foregrounded by locating the stereo microphone as close as possible to the these sources. On the third and final trip, sound was recorded using a pair of DPA 4060, miniature, omni-directional microphones, which had been mounted on a wire coat hanger[13]. Although the previously used XY stereo technique had achieved greater spatial definition, the use of omni-directional microphones allowed the full spectrum of frequencies to be conveyed in ways that the NT4's cardioid capsules could not have done. All microphone sources were recorded to a Marantz PMD661 at 44.1 kHz, 24-bit.

[12] The RØDE NT4 microphone features a pair of cardioid capsules in 'XY' configuration.
[13] During the wildlife sound recording course at Reepham, Chris Watson demonstrated this particular technique which uses miniature omni-directional microphones in AB formation.

5.4 Editing techniques

When these recordings were later examined, selections were extracted from them according to their soundscape elements and spatial perspectives. The process of auditioning and comparing these recorded selections strongly evoked sensations I had experienced while exploring Poranui, such as the briny smell of the sea, the feeling of cold wet feet and the heightened state of alertness provoked by its hostile environment. The compositional narrative closely follows these explorations, beginning at the backshore, close to the acoustic horizon, progressing across the foreshore towards the cliffs, moving gradually closer to the breaking waves on the longshore and finally finishing amongst the pebbles where the backwash grinds them down the bank. The editing techniques applied serve to enhance and expand my experience, by focusing on specific soundscape elements and making them shift around and into one another.

5.4.1 Multitracking

In *Poranui* different spatial perspectives are made to permutate by combining different recordings. Multitracking was used to combine two or more recorded selections, thus allowing them to be heard simultaneously. This first occurs at 05:00 when the perspective from the foreshore is combined with the already established perspective from the backshore.

5.4.2 Crossfading

In order to create for the listener the sensation of moving through the soundscape, selections that had been recorded from one position are crossfaded into selections from another. For example, between 03:15 and 05:15, when the listener is seamlessly relocated from the backshore to the foreshore. In order to create the effect of temporal continuity between these separately recorded selections, wave cycles are aligned visually by using graphical representations of their recorded selections (see Figure 1).

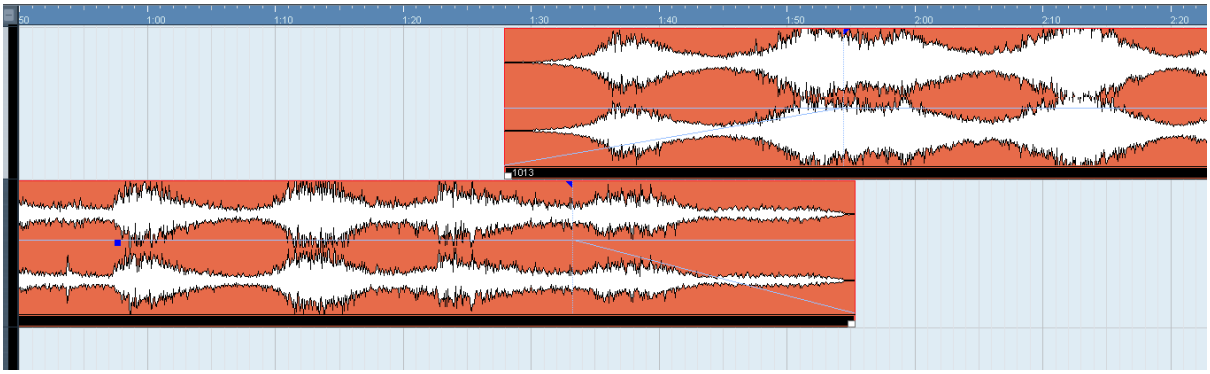


Figure 1. Screenshot from *Poranui* in the Cubase DAW, showing stereo waveforms, which had been recorded from different spatial perspectives, placed on separate audio channels. The oscillating wave cycles in each recording have been aligned visually in order to create an illusion of temporal continuity as one perspective is crossfaded into the other.

5.4.3 Gain

Gain is set for each selection in order to precisely balance amplitude levels between different soundscape elements. Sometimes this technique is used to distort this balance by setting particular foregrounded sounds to a higher gain level than those representing ambience; for example, between 06:10 and 07:00, when sounds coming from the nearshore are made to overpower sounds coming from the backshore. In this way micro-sounds are further enhanced by making them louder, thus allowing the listener to be enveezed by them in a way that might not be possible on location; for example, when pebbles are heard being sucked down the bank at 08:50.

5.4.4 Equalisation

As has been described, multitracking was used to juxtapose different spatial perspectives by allowing them to be heard simultaneously. However, when different perspectives are combined in this way, certain shared elements, especially those which change over time, can lose their spectral definition. It is therefore sometimes necessary to attenuate or enhance these elements by using equalisation to change the amplitude of the frequency ranges they occupy. Different recordings can then become complimentary to each other when they are played back simultaneously; for example, from 08:47 until the end, a recording featuring the near field micro-sounds of pebbles and foam was combined with an ambient recording of the offshore waves which had been made from further up the beach. On the nearshore recording a 1.8 kHz high-pass filter was used to isolate the sounds of pebbles and foam from the rumble of offshore waves. The recording made from the backshore provided a richer source for the

offshore sound; this was isolated by applying a 2 kHz low-pass filter to the recording. Thus the ambient and enveloping infra-sonic element, as it is perceived from one position, is combined with the high pitched, foregrounded elements as they are perceived from another.

A recording that had been made while the swash surrounded me on the longshore was compromised by infrasonic interference, this caused by the microphone's wobbling from side to side as I braced myself to retain my footing on the unstable ground. This sonic artefact would have put unnecessary strain on loudspeakers during playback had it not been removed by applying a high-pass filter at 20Hz.

As has been shown, specific acoustic components can be presented by combining two or more recorded selections conveying different perspectives, applying gain and equalisation to them where necessary. These interventions serve to engage listeners' focus by taking them on a journey in which environmental sounds are interchanged or set against each other, thus abstracting them while at the same time sustaining their locational context. *Poranui* conveys the overwhelming power of the sea, which is felt as well as heard, by transmitting its acoustic vibrations. The piece begins with the distant rumbling of the sea's combined sonic elements whose individual parts are gradually foregrounded as it builds towards an unsettling climax. For this reason *Poranui* is best diffused through a loudspeaker system capable of reproducing very low frequencies. However, it can also be diffused, but to lesser effect, through a domestic hi-fi system or through headphones.

5.5 Concluding comments

Poranui is a meticulously structured piece in which soundscape voices are allowed to 'sing' for themselves, thereby highlighting the uniqueness of the location. The sound of the sea in the distance at the beginning is an easily identifiable but not necessarily distinctive sonic image. However, individual voices emerging from this keynote gradually envelop the listener, their visceral proximity provoking a sense of unease. The listener's established patterns of perception are then confronted by their auditory system insisting that they are being taken deep into a hazardous environment. The expressive nuances of these voices are foregrounded and re-contextualised in various permutations, thereby allowing the listener's initial perception of a referential soundscape to shift towards that of an abstract musical

encounter, as soundscape elements become hyper-real. Because these voices had been exposed to the ‘acoustic lens’ of the microphone, listeners are drawn into an astonishing and inhospitable environment in ways they could not otherwise have chosen.

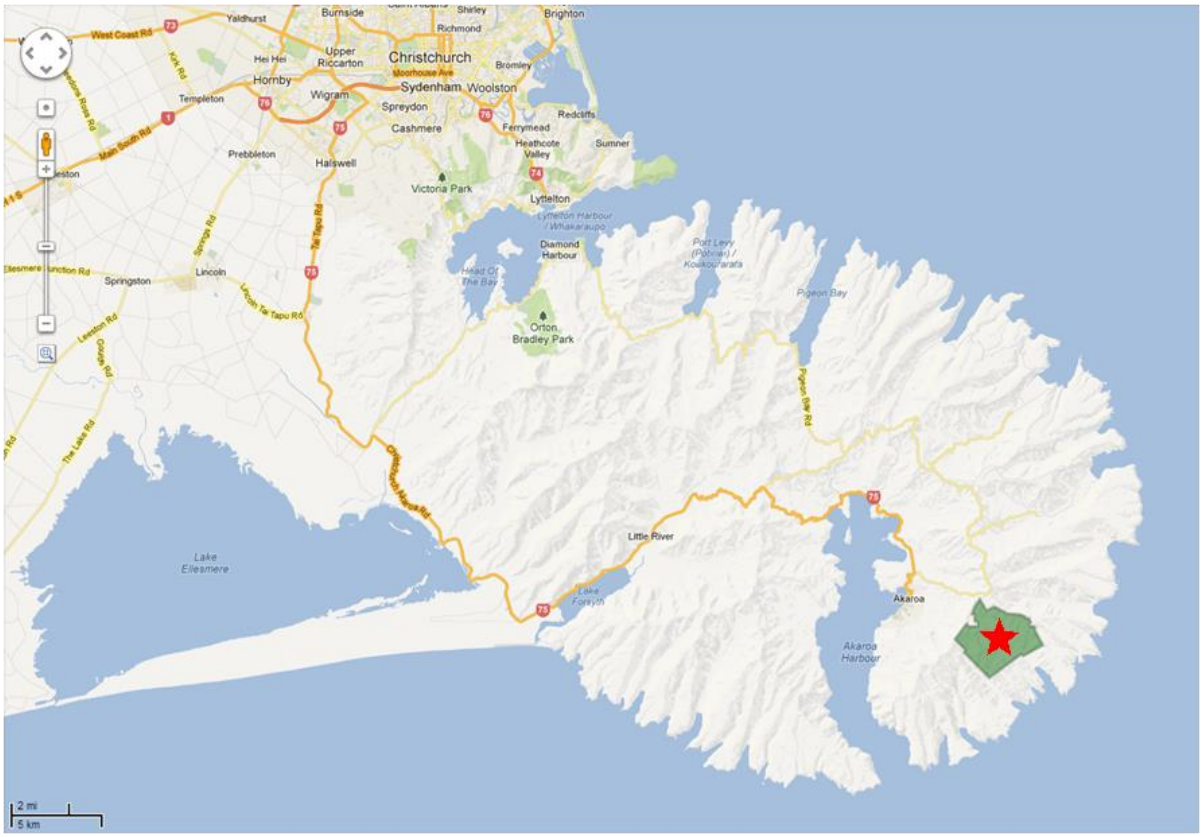
6 Hinewai Reserve: Serendipity

I found Hinewai Reserve to be the most challenging location for soundscape composition and this I attribute to several factors. Hinewai is often very quiet, except during the summer months when its soundscapes are dominated by the stridulation of cicadas during the day and even on warm nights. The resonant characteristics of its open locations are often attenuated by typically windy conditions, while sound coming from a fast flowing stream dominates the bush ambience down the sheltered main valley. In spite of rigorous pest control in the reserve, close encounters with native bird species are unusual outside their most active periods during dusk and dawn.

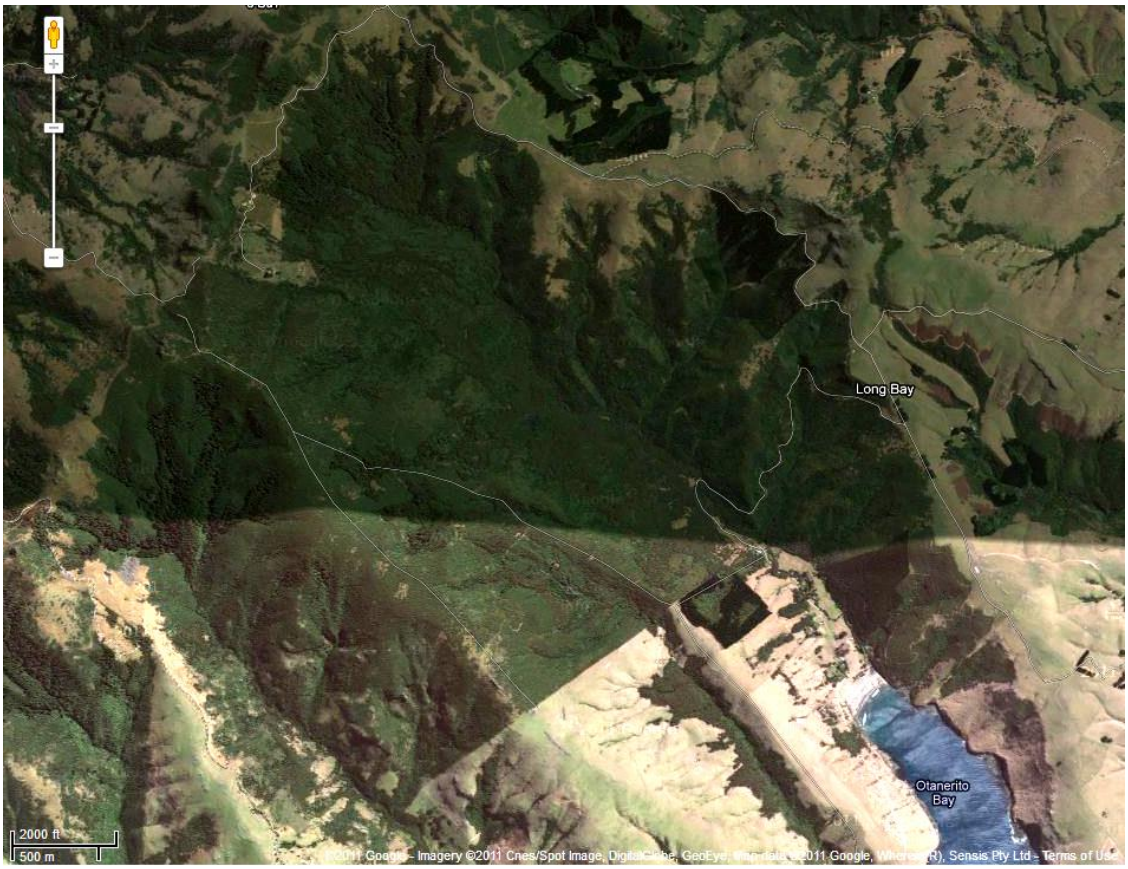
I have visited Hinewai seven times during the past three years, usually spending two nights there at a time in order to access its soundscapes at dusk and dawn. Although every visit has provided rewarding listening experiences, very few of these stood up to the contrivance of field recording. On such occasions the weather and wildlife coincided to produce complex, intriguing and spectrally rich soundscapes; these included a cicada's performance at close range, an encounter with a now rare wild bee colony, a performance in the still, damp bush following a summer storm and recording the acoustically illuminated space around a farm pond on a summer afternoon.

6.1 Location

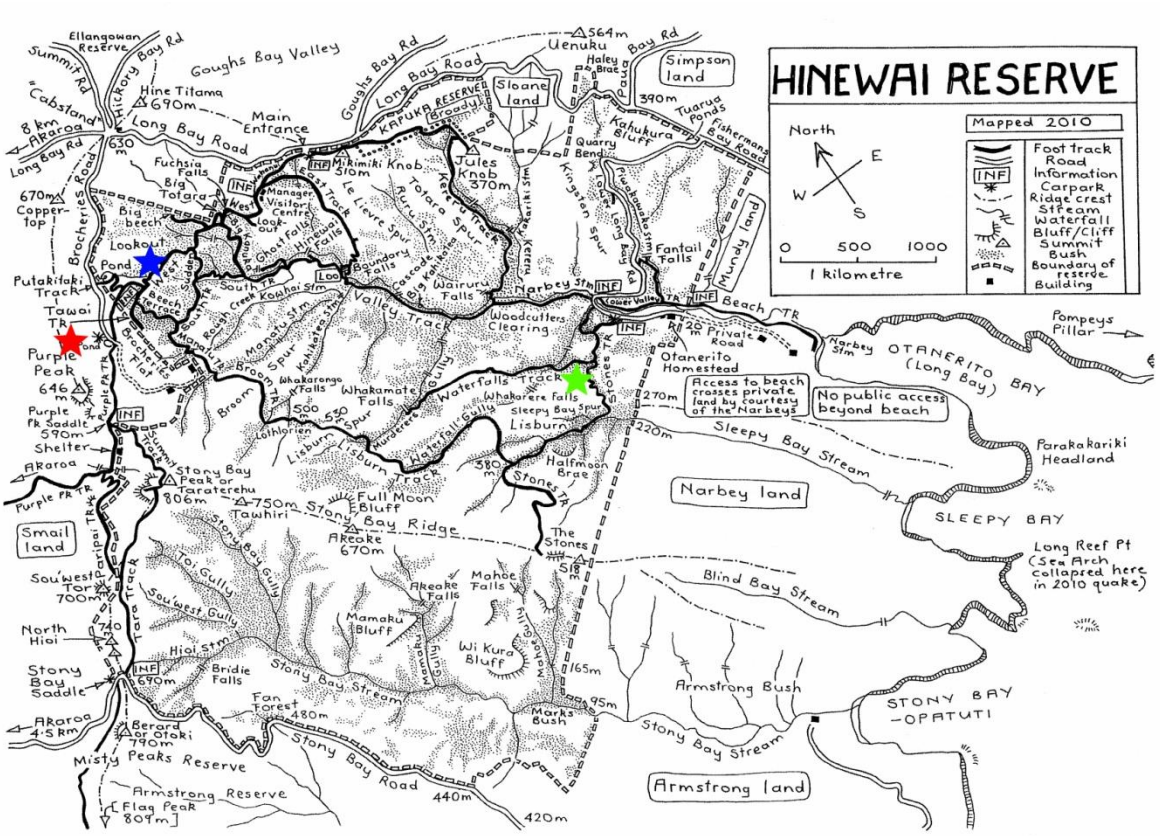
Hinewai Reserve is a privately run conservation area of 1250 hectares located on Banks Peninsula, Canterbury, about 10 km northeast from the Akaroa harbour inlet (see Map 3). Since being established 25 years ago it has expanded substantially and native flora and fauna are regenerating (see Map 4). Although visitors are welcome, conservation is the primary function of the reserve, with pest control taking priority over track maintenance. Occupying most of three catchments, valleys stretch from close to sea level up to subalpine peaks. Otanerito Bay is accessible via a public walkway through a farm. Hinewai Reserve is not on the way to anywhere, does not serve the tourist industry and is far from main roads and flight paths, thus avoiding domination of its soundscapes by electromechanical anthrophony.



Map 3. Banks Peninsula. Location of Hinewai Reserve marked with a red star. Source: Google Maps.



Map 4. Satellite image of Hinewai Reserve and Otanerito Bay showing bush regeneration. Only about 50 hectares of this are old growth. Source: Google Maps.



Map 5. Recording locations at Hinewai Reserve marked with coloured stars. Source: Hugh Wilson (unpublished).

This series of compositions focuses on three recording sites at Hinewai Reserve (see Map 5). The chapter is therefore divided into three main parts, each relating to one of the three sites. The first two sites each feature one composition and the third site features three compositions. With the exception of *Cicada*, these compositions occurred spontaneously and involved little interventional editing. I have therefore not used separate headings for *location*, *acoustic elements*, *performance*, *field recording* and *editing techniques*, as I have done in chapters that focus on only one composition. I instead encompass these themes collectively as each composition is discussed.

6.2 Cicada

Cicada abstracts and foregrounds a summer keynote sound against its ambient soundscape elements using recordings made in the bush at Hinewai Reserve during the late afternoon of 18 February 2012. The recording site is marked with a green star (see Map 5). The hypnotic stridulation of a cicada obfuscates the goings on of other wildlife; the acoustic space around and behind it is filled with many

distant cicadas, transient birds and flies occasionally passing close by. Abstraction in this soundscape composition occurs as I distort its elements, both spatially and temporally.

Photograph 2. A chorus cicada at Hinewai Reserve. Photo Chris Reddington.

The two recordings used in *Cicada* were made at a sample rate four times that of a compact disc, which allowed them to be of the highest possible definition when they were later slowed down. The cicada was recorded when it landed very close to one of my microphones and stridulated there for several minutes; this recording technique is similar to that used in 'focused sound' when a single sound source is recorded at close range and in mono. The bush ambience was recorded at a bush location several minutes' walk up the hill, by attaching a pair of omni-directional microphones onto branches with about 60cm between them. During this recording I left the area for nearly an hour, anticipating that birds may venture closer to my microphones. This compositional decision was successful because during recording several birds are heard inside the recorded area, creating a soundscape which might not otherwise have been possible. All sound sources were recorded with DPA 4060 miniature omni-directional microphones to a Sound Devices 702 at 176.4 kHz, 24-bit.

The recording of the cicada is slowed down to quarter speed in order to transpose the insect's ubiquitous summer song to a speed and pitch more within the range of human hearing, thereby revealing inconsistencies in the cicada's hypnotic pulse and shifts in its rhythmic pattern. This 'hyper-real' macro-sound is gradually combined with the stereo recording of bush ambience by slowly increasing its gain, from zero, on a separate mono channel. In this way the abstracted sound is juxtaposed directly with both its environmental context (the bush ambience) and its source (being the cicada's heard in the background). Eventually, the ambient recording is also abstracted when it is crossfaded into a slowed down version of itself; the bird calls then become more like tuned wind instruments combining with the percussion-like patterns of the already slowed down cicada. Equalisation is applied to these slowed down selections in order to highlight specific spectral fragments, such as the 'pop' at the beginning of each stridulation and the now flute-like bird calls.

6.3 Broucherie's Road Pond

On December 30, 2013, an afternoon was spent recording by a farm pond, just outside Hinewai Reserve. The soundscape here represents a quintessential summer scene of rural New Zealand, illuminated by ambient sounds co-existing in distinct spatial layers. In the absence of a narrative, the listener is free to focus on different parts of this spatial dimension. However, half way through the piece the dynamic shifts when gusts of wind, heralding a change in the weather, are joined by a spontaneous instrumental performance. The recording site is marked with a red star (see Map 5).

Soundscape elements in *Broucherie's Road Pond* are: micro-sounds from hovering dragonflies and other insects moving in and out of the extreme foreground; occasional gusts of wind buffeting the microphone's wind cover; and macro-sounds coming from distant lambs, cicadas, birds, soprano saxophone and trumpet. Echoes from some of these macro-sounds are reflected off the surrounding rocky landscape. In the second half, the drone of a lawnmower in the extreme distance blends with the flying insects.

My soprano saxophone suddenly commences towards the end, after the gusts of wind together with cries from farm animals and a distant lawnmower, have subtly shifted the soundscape's dynamic. An

undulating motif is ornamented by moving the instrument's bell, which had been submerged beneath the pond water, this causing the pitch to be modulated to create a scooping effect and sometimes a jump between harmonics. As the motif is developed Joseph Derrick's trumpet joins with sustained long notes, until a whole-tone, held between the instruments, signals the ending.

Sennheiser MKH30/60 microphones, in mid-side configuration, were mounted in a windshield and positioned at the edge of the pond, specifically in order to foreground dragonflies and to capture echoes reflected from the surrounding rock faces. Microphone sources were recorded to a Sound Devices 702 at 44.1 kHz, 24-bit.

The only editing intervention made in *Broucherie's Rd. Pond* is the creation of a temporal frame around a linear series of events. This series of events can be perceived in two parts; the first, which consists of indeterminate environmental sound is interrupted by the second in which gusts of wind and musical instruments emerge. The ending is signalled by sustained notes on trumpet and saxophone.

6.4 From a Red Beech Clearing

Pockets of tall, red beech trees at the north-west side of the reserve, provide open spaces beneath their canopy in which I have on many occasions explored, listened, played and recorded. These three pieces are all from a clearing at the West track and Purple Peak track junction, but were recorded during very different environmental conditions. The first of these pieces focuses on the bush ambience following rain and the second and third feature performances, one alone and the other with wildlife. The recording site is marked by a blue star (see Map 5).

6.4.1 Beech Umbrella

Beech Umbrella was recorded on December 30th, 2013, after the downpour which followed *Broucherie's Rd. Pond*. When water drips from the beech canopy onto my large umbrella, it becomes an instrument without the need for intervention, its segments an array of drum skins whose proximity is perceived through the suddenness and clarity of each drop. This texture of many sounds is in timbral, spatial and dynamic contrast to the ambient birdsong in the cool, humid air. Different sized drops of water falling from various heights are perceived through variations in their amplitude and pitch, as they

Photograph 3. The composer in a red beech clearing at Hinewai Reserve. Photo Joseph Derrick.

hit the umbrella. There is no regularity to their rhythm, but its density and amplitude increases when gusts of wind, high in the canopy, trigger cascades.

Sennheiser MKH30/60 microphones, in mid-side configuration, were positioned below the umbrella, on a tree stump. These sources were recorded to a Sound Devices 702 at 44.1 kHz, 24-bit.

6.4.2 Pensive

Although it was late summer, a morning shower on February 19th, 2012 had cooled and dampened the atmosphere, silencing the cicadas and enhancing the bush's resonance, which together with muted birdsong offered a contemplative soundscape in which to improvise on soprano saxophone, using a sparse sonic palette in a series of gestures, playing intuitively by focusing on the immediacy of my being present in this space. *Pensive* could be perceived, by the listener, as explicitly featuring my performance. However, my intention as a soundscape composer is to find ways of engaging the

soundscape on its terms. I consider my improvisation becoming a foregrounded soundscape element to be the result of an intuitive and spontaneous decision to temporarily illuminate this hushed space.

My performance begins by exploring a tritone which is a recurring feature throughout the piece. Although there was no predetermined strategy behind using this interval, it does provide ambiguity when heard out of a harmonic context; this ambiguity is complimentary to the hypnotic momentum of initial phrases which are played in single breaths followed with gaps of the same length. During this sustained, suspended rumination, the location's fragile ambience comes into focus. Within each played gesture pitches slide into each other, often in coordination with abrupt dynamic changes. In the resonant space this creates a shimmering effect. Three longer phrases in the middle use circular breathing to sustain the sound which is modulated by using flutter tonguing. A following series of shorter, phrases focus on more abrupt articulation, which precedes several increasingly soft and sustained trills retreating finally into the subdued ambience. In retrospect this performance suggests that my childhood experiences of listening to Gorō Yamaguchi's shakuhachi music[14] had been osmotic.

DPA 4060 omni-directional microphones were placed 1 metre apart and pegged onto branches, about 25 metres away from the position where I played. These sources were recorded to a Sound Devices 702 at 44.1 kHz, 24-bit.

6.4.3 Wild Bees

A wild bee colony was discovered in a dead beech tree on March 18th 2012, during the still afternoon. This recording was made from inside the tree: in the foreground the micro-sounds of bees are heard as they come and go, occasionally colliding with the microphones and ambient sounds come from birds and cicadas. The rotating effect of my soprano saxophone is achieved by my slight movement from side to side while playing from close range to the tree. A low, sub-tone trill, close in pitch to the drone of the hive and sustained by circular breathing, filters through the hundreds of small insects. Doodle tonguing is used as the pitch moves upwards, creating a more agitated texture. The performance

[14] *A Bell Ringing in the Empty Sky* (1969).

culminates in a long breath through the instrument which, combined with a tight embouchure, creates a high, grainy texture similar to that produced by the intimate beating of insect wings.

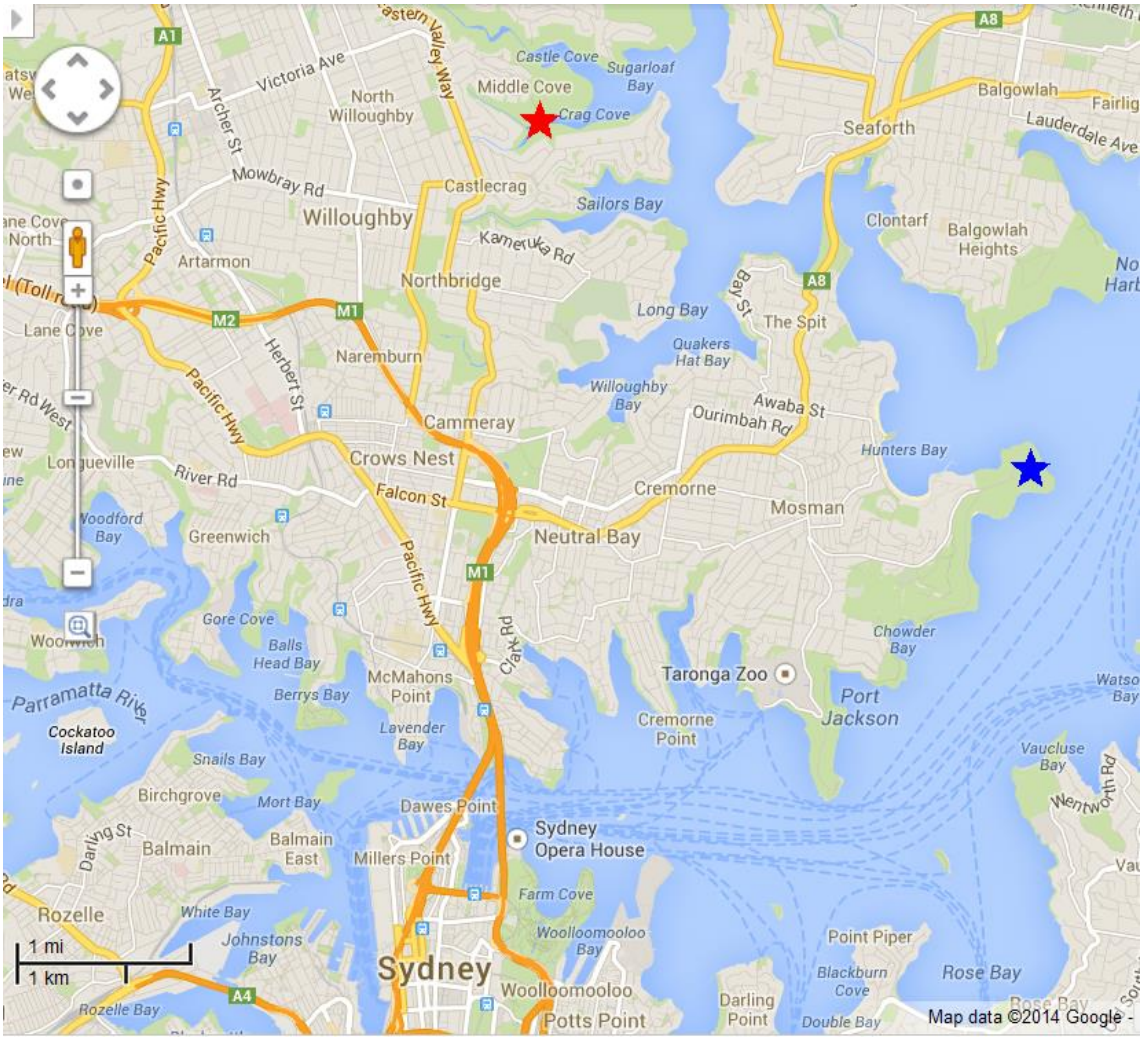
DPA 4060, omni-directional, miniature microphones were attached to sticks and inserted into separate spaces inside entrances on either side of the tree, giving the listener a perspective from inside the tree. Microphone sources were recorded to a Sound Devices 702 at 44.1 kHz, 24-bit. When I next visited Hinewai in October I discovered that this colony had fallen to varroa mite.

6.5 Concluding comments

These compositions all represent discoveries made in the soundscapes of Hinewai Reserve and in which serendipity plays a major part. These include: my spontaneous decision to record, at a high sample rate, a cicada which landed near my microphone; removing myself from an environment during recording and incorporating the result into a composition; using an umbrella to perceive the rhythms produced by water falling from the bush canopy; and using microphones to listen from inside a wild bee hive.

7 Sydney Harbour: Middle Cove and Middle Head

Sydney Harbour is a very different seaside location from Birdlings Flat, in that it encompasses urban, industrial, maritime and bush environments, in which acoustic elements overlap, compete and combine. *Sydney Harbour* presents two different locations where recordings were made during February, 2013. The first of these is a sheltered nature reserve at Middle Cove and the second is inside a historical, military fortification at Middle Head. These recordings feature improvised performances by Joseph Derrick on trumpet and myself on clarinet. This chapter is divided into two parts, each focusing on a different location.



Map 6. Sydney Harbour. Harold Reid Reserve, Middle Cove is indicated with a red star and Middle Head is indicated with a blue star. Source: Google Maps.

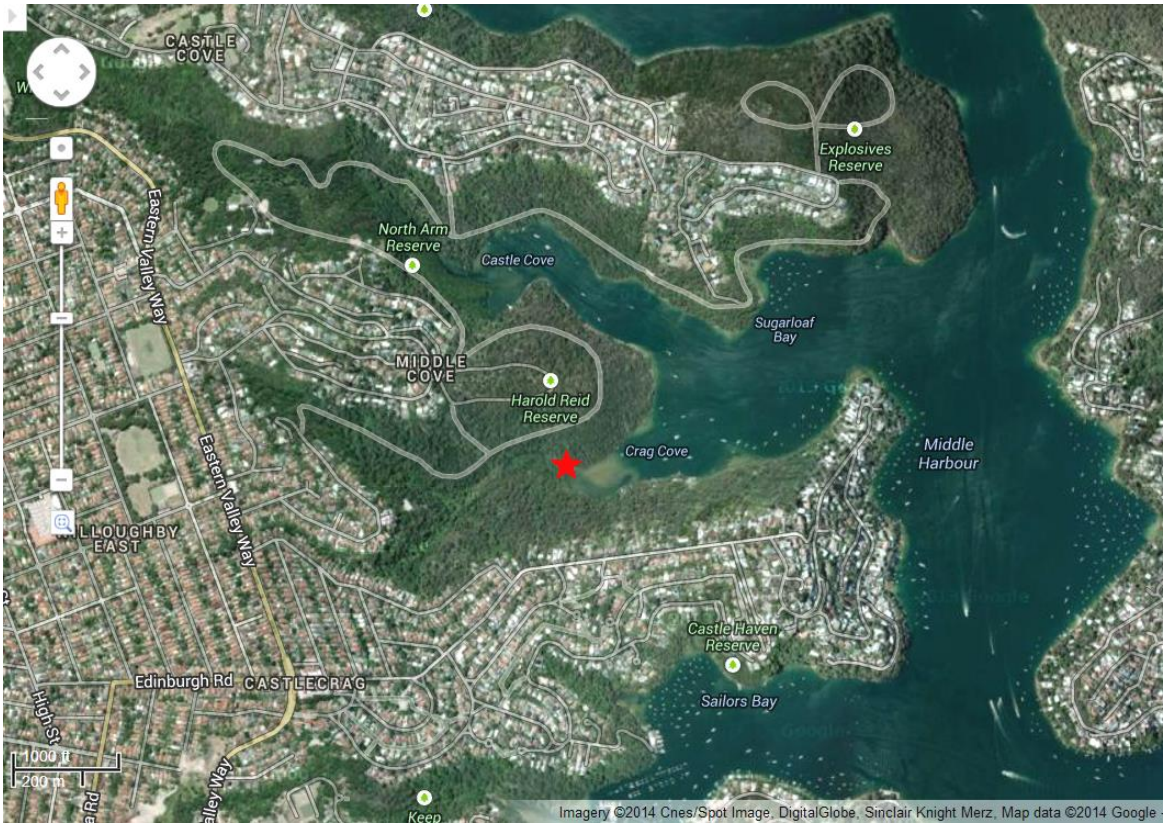
7.1 Middle Cove

Two visits were made to Harold Reid Reserve, Middle Cove. The first of these was during a period of dry weather, on the afternoon of 23 January 2012 and the second was after a period of wet weather, on the morning of 5 February 2013. A serendipitous start to the first visit was interrupted by a curious kayaker, after which a shrill cicada chorus and gusty breeze together masked the soundscape which had been so compelling. The second visit was more successful owing to very different environmental conditions. When we arrived on the shore at 9am, the air was cool and very still and a light drizzle cleared within half an hour. As the cloud lifted and the temperature rose, a cicada chorus gradually commenced, with several durations of silence. I recorded nearly two hours of varying biophony, geophony and anthrophony which included improvisation using clarinet and trumpet.

Sounds coming from wildlife, people, weather and transport can be heard at most places in the harbour, their idiosyncrasies, combinations, densities and amplitude levels vary between locations, seasons and times of day. Resonant spaces created by built up areas, bush, rocks, waterways, hills and valleys all carry these sounds in distinctive ways, by filtering, amplifying, reflecting or absorbing them.

7.1.1 Location

Harold Reid Reserve is located seven kilometres north of central Sydney, at Middle Cove, Willoughby (see Map 7) and features a circuit track. The hilly landscape consists of mangroves, woodlands, open forest and a wet gully. The track passes through or alongside all of these areas and often close to the water's edge, from where the rocky shoreline can be reached easily. Wildlife is abundant with many different creatures including insects, spiders, birds, reptiles, crustaceans, fish and possums. This resource-rich area was once inhabited by the Cammeraygal tribe, whose traces can be found in remains of rock shelters, a fish trap and in middens (Willoughby City Council, n.d.). The character of the biophony varies with changes in season, daylight and weather.



Map 7. Satellite image showing Harold Reid Reserve, Middle Cove, Sydney Harbour. The recording location is indicated with a red star. Source: Google Maps.

Photograph 4: Looking east from the recording site at Middle Cove. Photo: Joseph Derrick.

7.1.2 Acoustic elements

Harold Reid Reserve is popular with walkers and runners, whose footsteps and voices are transient soundscape elements. The conspicuous activities of field recording and performance were therefore undertaken on a weekday morning, when interruption by curious passersby was less likely to occur. Other anthrophonic elements come from overhead aircraft and the 'monster breath'[15] of boats, ferries road traffic, sirens and other machinery, these being filtered by the hilly landscape and dense vegetation. The surrounding terrain and body of water create a resonant space in which the macro-sounds of birds, insects, jumping fish, voices and musical instruments carry over long distances. Geophonic micro-sounds include drizzle landing on the water, waves lapping against the rocky shoreline and gurgling below rock ledges, as well as water trickling off the hillside and onto the rocky shore, which is foregrounded in *Clarinet and Trickle*. Part of a conversation between two walkers is heard, unaware they were being recorded, as they pass the recording location in *Clarinet, Trumpet, Birds, Walkers and Plane,* creating a referential interlude, reinforcing the locational context. On several occasions during this set of pieces, flying insects are heard in the extreme foreground as they randomly pass close to the microphones. The calls of many transient birds, including honey eaters, rosellas, currawongs, cockatoos and magpies, are heard coming from all directions and in various combinations. *Clarinet, Trumpet and Cicadas* culminates in a nearby cicada chorus crescendoing into an oppressive shrill. In all these pieces, sounds of building and machinery are heard intermittently, coming from far away.

7.1.3 Performance

During the first 20 minutes of recording, we just listened, intuitively allowing our hearing and other senses time to become attuned to the location. When performance commenced, specific soundscape events were sometimes perceived as musical signals prompting responses; for example in *Clarinet and Trickle* mimesis occurs when the foregrounded sound of trickling water is joined by the clarinet being played with spit in the mouthpiece. Other responses are made to the character of the entire soundscape;

[15] A term used by George Foy (2010), to describe the constant low frequency background drone which emanates from cities and carries across large distances.

for example, at the beginning of *Clarinet, Trumpet, Birds, Walkers and Plane* when the distant, sustained clarinet emerges from the stillness of the drizzle. The clarinet here is played with the bell detached and the end of the lower joint pushed against my leg, thereby changing the instrument's timbre and pitch, when sound is forced to emit from its open tone holes. Phrasing is sparse and unhurried and microtonal pitches are often modulated; they do not constitute any particular scale. Birdcalls at 11:20 are mimicked by a sustained, jittery texture produced by the clarinet, this achieved with the aforementioned omission of the bell together with circular breathing and doodle tonguing; this continues and builds alongside the sound of a passing aircraft slicing through the soundscape until a sustained trumpet note signals the ending.

Photograph 5: The composer playing clarinet with the bell detached at Middle Cove. Photo: Joseph Derrick.

7.1.4 Field recording

A pair of DPA 4060 miniature, omni-directional microphones, with wind covers, were used to record the entire session. In *Clarinet, Trumpet, Birds, Walkers and Plane,* and *Clarinet, Trumpet and Cicadas* these were clipped onto branches which had been placed, approximately 80cm apart, at the water's

edge, in order to foreground the drizzle pattering on the sea and splashing into puddles in the volcanic rock.

In *Clarinet and Trickle* the microphones were spaced a similar distance apart, but had been clipped onto branches of a tree in order to foreground the sound of water trickling off the hillside (see Photograph 6). Microphone sources were recorded to a Sound Devices 702, at 44.1 kHz, 24-bit.

Photograph 6: Recording site at Middle Cove showing pink clothes pegs attaching miniature microphones to branches. Photo: Joseph Derrick.

7.1.5 Editing techniques

Structure emerges in the Middle Cove pieces at junctures where particular sounds from birds, insects, instruments and aircraft are interpreted as musical cues. During the process of editing, these cues identified the start and finish points of individual pieces; for example, the beginning of *Clarinet, Trumpet and Cicadas* is signalled by birdcalls prompting a response from the clarinet and the end is signalled by the cicadian chorus, in the foreground, abruptly stopping. Once individual pieces had been extracted from the recordings, slow fade-outs are applied to their endings, rather than abrupt cut-offs.

The rationale behind using this technique was to gently withdraw the listener from the soundscape, in effect crossfading the composition into the relative silence surrounding its playback. This sustains the listener's perception of the place, beyond the end of the recording.

While editing the recordings I perceived the amplitude of the distant, low-pitched 'monster breath' as being relatively higher than that of other soundscape elements, compared to my perception on location. This I attribute to the omni-directional microphones' characteristic sensitivity to low frequencies, as well as the ability of the human auditory system to filter out sounds that are not the focus of foreground listening. In order to restore this focus I used equalisation to progressively attenuate sounds below 80Hz.

7.2 Middle Head

The pieces from Middle Head feature a resonant space in a historical military fortification. At 4pm on the fine, still afternoon of February 4th 2013, we explored the tunnels and gun emplacements until we found our way into a semi-underground chamber built of concrete and brick, whose dimensions were about four metres wide, fifteen metres long and slightly more than two metres high (see Photograph 7). This enclosed space was accessible only by squeezing in through a small opening from outside, where a rusty shutter had become detached from its frame; its main doorway from an adjacent passage was padlocked. The shape, size and hard surfaces of the bunker give it a distinctive resonant characteristic in which sound reverberates strongly for about two seconds. This resonance is explored using clarinet and trumpet, as well as sound produced by striking a wall.

7.2.1 Location

The Middle Head fortifications date from 1873 when the first gun battery was built there. They were later extended and used by the military until 1967. The site became part of the Sydney Harbour National Park in 1979 and today parts of the underground tunnel network and some of the bunkers and magazines it connects, are accessible to the public (Sydney Harbour Federation Trust, 2009). The site is elevated, bush clad cliffs dropping abruptly to the outer harbour on three sides. The suburb of Manly can be seen to the north-east and Vaucluse is visible due south.

Map 8. Satellite image showing the recording location at Middle Head. The site of the chamber is marked with a red star. Source: Google Maps.

7.2.2 Acoustic elements

External sounds, almost inaudible, filter through small openings to the outside. These come from the low-pitched churning of the sea below the nearby cliffs and the distant 'monster breath' of ferries and aircraft. Other external sounds come from the voices of walkers. All sounds occurring inside are amplified and sustained by the parallel hard surfaces of the chamber, these coming from clarinet and trumpet, as well as our footsteps. The rear brick wall which is a facade, presumably masking sandstone rock, is sometimes used as a drum, resonating deeply when I thump it with my boot.

Photograph 7. Inside the chamber at Middle Head viewed from the southern end. Photo: Joseph Derrick.

Photograph 8. Looking west from the chamber at Middle Head. Photo: Joseph Derrick.

7.2.3 Performance

In this inherently quiet place, nearly all soundscape elements are produced by visitors. One's speech, footsteps and breathing are amplified by its resonance, affirming my conviction that the listening subject inevitably becomes a part of any acoustic space they occupy. As Barry Truax describes:

> The sound of the self is ultimately intertwined with the environment […] Even our own voice comes back to us with the properties of the immediate environment embedded within it (Acoustic Communication, 2001, p. 38).

This phenomenon is exploited to its extreme in Alvin Lucier's composition *I Am Sitting in a Room* (1969), when the resonant frequencies of an ordinary room are exponentially multiplied by recording a spoken text and then recording its playback in the same room. The new recording is then played back and this cycle continues until the spectral content of the original spoken utterance has transmuted into the harmonic frequencies of the room itself. By contrast, the pieces from Middle Head engage the resonant characteristics of the bunker by exploring them in a reflexive way which focuses on the performer's intuition rather than on a prescribed process. As performers we respond spontaneously to the space's resonance as it is activated by our musical instruments. These pieces in particular demonstrate the previously described bio-feedback loop. The location's reverberance, rather than being regarded as a means of flattering one's musical invention by enhancing instrumental sound, is instead the fundamental part of a soundscape which is being illuminated and explored using musical instruments. This is a permanent and profound context which required us to play beyond our previous experiences.

Rust, Cavity, Breath, Stillness, Motion was the first performance to take place during this field trip and focuses on our exploration of the space. This exploration entails several changes in strategy, resulting in contrasting densities, textures, pitches, dynamics, durations, timbres and articulations. This piece begins with the clarinet exploring two notes, a micro-tone apart, while somebody outside tinkers with a rusty door latch. This evolves into a duet between clarinet and trumpet punctuated by my occasional thumping on the wall. This section gradually dissipates into detached micro-sounds, which then

modulate into a dynamic and sustained texture. The following two pieces, however, focus on much more specific musical strategies.

In *Clarinet Drone Trumpet Pops,* spatial modulation occurs spontaneously as the performers move around, ending with the trumpet in the distance and the clarinet in the extreme foreground. This movement is perceived through their amplitude and spectral clarity changing in relation to their proximity to the microphones. Only a few sounds are used: the clarinet begins by playing sustained notes in its lower register and then jumps up to a high-pitched, gurgling texture, produced by using spit in the mouthpiece; the trumpet plays a consistently irregular rhythm using its valves to produce popping sounds.

In *Wall of Sound,* a dense and strident clarinet produces a flood of short sounds whose played durations are substantially shorter than that of their reverberations. In this piece I attempt to make every square inch of air vibrate in the confined space by using its resonance to make many different pitches, including split harmonics, occur simultaneously, thereby concealing a monophonic instrument's idiosyncratic transients.

7.2.4 Field recording

A pair of DPA 4060 miniature omni-directional microphones were attached to the remains of metal wall fixtures and spaced approximately 60cm apart. Sources were recorded to a Sound Devices 702, at 44.1 kHz, 24-bit.

7.2.5 Editing techniques

Editing the recorded material from Middle Head was very simple because points at which individual pieces started and finished were defined by instrumental performance. Temporal frames were created around three of the performances.

7.3 Concluding comments

The pieces from Middle Cove all reveal the participants' delight at becoming acoustically intertwined with the place. Such a position allows compositional contrivance to be bypassed, environmental sounds

being perceived without a need for their musical justification or resolution. The performers freely assert their acoustic presence without trying to impose structure or prescribed strategies. Environmental sounds are engaged in relation to their sources, ecologies, locations, textures, pitches, rhythms and patterns. Field recording of this musical engagement, together with retrospective editing define spatial and temporal frames around specific parts of the soundscape, thereby conferring a coherent structure. Middle Head reveals a different sort of 'becoming intertwined'; this happens when an otherwise almost soundless space is acoustically illuminated by participants.

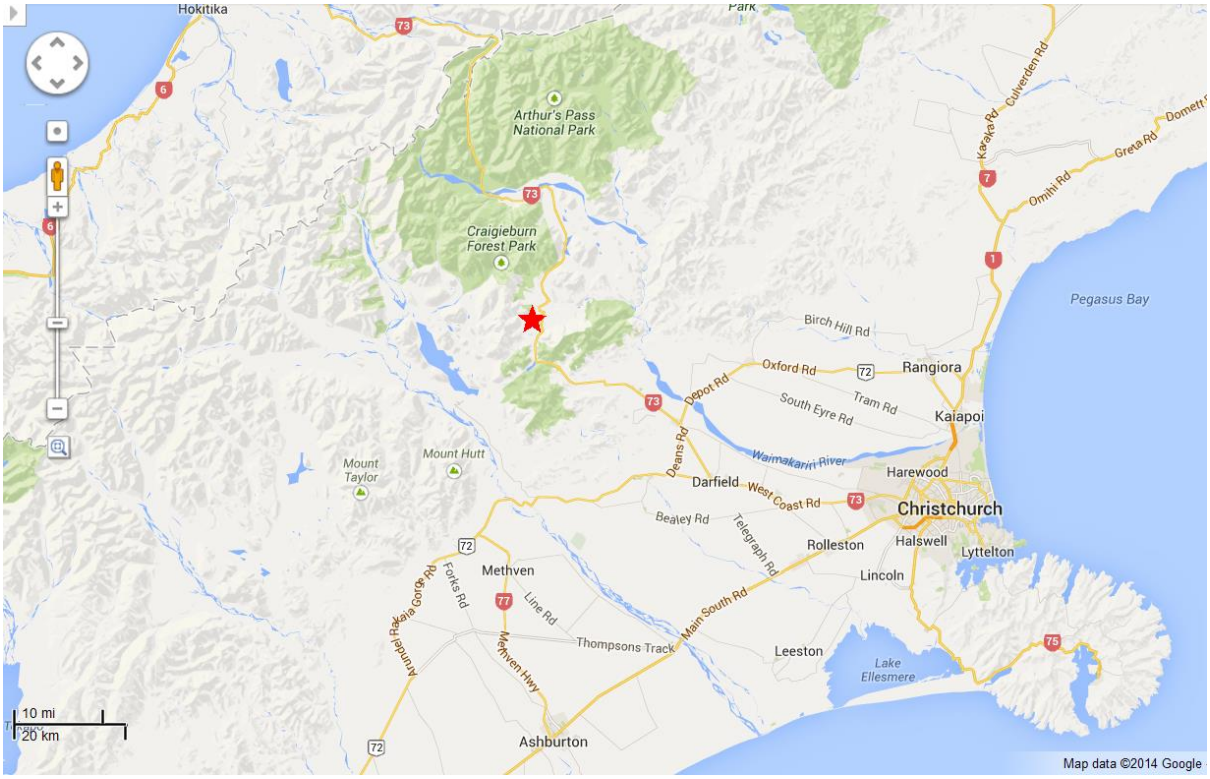
8 Kura Tawhiti: Space that sings

Whereas the bunker at Middle Head is a manmade, symmetrical, confined space in which macro-sounds are immediately transformed and even micro-sounds reverberate distinctively, the outdoor amphitheatres at Kura Tawhiti, by contrast, provide expansive, natural, resonant spaces, requiring high amplitude sounds to activate their echoes. Well off the footpath and towards the northern end of this alpine reserve, a site surrounded by limestone escarpments provides an isolated amphitheatre in which I produced long echoes by playing soprano saxophone.

This chapter focuses on a recording I made during my most recent of three field trips to Kura Tawhiti (except for section 8.3 which discusses technical issues relating to all visits). Because of its exposed and not easily accessible alpine location, the dominant environmental dynamic at Kura Tawhiti is the weather. The most important musical aspect of *Kura Tawhiti* is echo, this being dependent on still weather. Although temperature and humidity subtly affect the nature of the echo, other soundscape elements, biophonic, geophonic and anthrophonic are not expected to vary much because there are no trees and few visitors. Rather than being a definitive work that has emerged from a multiplicity of events and environmental conditions aligning in a particular way, *Kura Tawhiti* represents an ongoing engagement with the more-or-less constant soundscape occurring during still weather.

8.1 Location

Kura Tawhiti, also named Castle Hill by early European travellers, is a conservation area located 90 kilometres northwest of Christchurch. Situated between the Torlesse and Craigeburn mountain ranges of New Zealand's South Island, it has an elevation of 700 metres. Its most distinctive geological feature is rampart like limestone rock formations, making it a popular site for climbers and walkers. Kura Tawhiti, meaning 'the treasure from a distant land', has great historical significance for the Māori Iwi (tribe), Ngāi Tahu, who are actively involved with the management of its conservation. Knowledge of trails, shelters, rock drawings and historical food cultivation sites is an intrinsic part of past and present tribal identity (Legislation NZ, 1998).



Map 9. Kura Tawhiti, Canterbury, is marked with a red star. Source: Google Maps.

8.2 Acoustic elements

I have been visiting Kura Tawhiti specifically in order to explore the complex and distinctive echoes reflected by its landscape. Apart from the sounds I produced, other soundscape elements were very quiet on each visit. In *Kura Tawhiti*, these micro-sounds can be heard in the foreground: ubiquitous grass cicadas produce a continuous, high-pitched pulsating texture, without variation; occasional, gentle gusts of wind rustle the tussock and buffet against the microphones; flies randomly buzz close to the microphones like drunken kazoos, creating brief but chaotic melodic interruptions. The distant drones from vehicles occasionally passing on State Highway 73 are barely perceptible (see Map 10). The dominant sounds, although not in the spatial foreground, are the continuous and strident soprano saxophone along with its echoes reflected by the surrounding landscape. These acoustic reflections are coloured uniquely by the geography; their different durations, directions and timbres determined by the limestone formations' various sizes, shapes and distances. The most distant acoustically reflective surfaces are about 200m away from the recording site (see Map 10), therefore the maximum delay time is slightly less than two seconds.

Map 10. Satellite image of Kura Tawhiti, Canterbury. The recording position is marked with a red star and the carpark is marked with a blue star. Source: Google Maps.

8.3 Field recording

The echoes of *Kura Tawhiti* are clearest and most striking during periods of still weather, because wind attenuates acoustic resonance. Furthermore, even when wind covers are used on microphones, strong gusts can cause audio clipping when recording with high pre-amp gain, a necessary means by which to encompass this particular soundscape's entire dynamic range.

Each visit to this exposed location occurred during fine weather and investigated different microphone and instrument configurations. From my first visit on March 12th, 2011, my recording using a RØDE NT4 (XY) microphone, distinctly conveyed from which directions the clarinet's multiple echoes came. However, their dynamic presence was overpowered by sound coming directly from the clarinet, in spite of it having been played more than 10 metres away from the microphone. On the following visit, on April 1st, 2012, I positioned omni-directional DPA 4060 microphones 4 metres apart in AB formation. This resulted in a less defined soundstage than had been achieved with the XY configuration. This time the clarinet was played about 20 metres away from the microphones, resulting in a better recorded balance between the foregrounded clarinet and its ambient echoes. When *Kura Tawhiti* was recorded

during my most recent visit on May 15th, 2013, the omni-directional microphones were again spaced by 4 metres, but this time positioned on either side of a boulder, in an attempt to record a wider soundstage by creating stereo separation. The soprano saxophone was played from more than 30 metres away. As a result of the boulder's presence between the microphones, the resulting AB stereo soundstage was slightly clearer than that recorded during the previous visit, but less clear than that which had been recorded using an XY configuration during the first visit. These technical amendments, along with a more musically cohesive performance, resulted in the most successful recording so far. Microphone sources in *Kura Tawhiti* were recorded to a Sound Devices 702, at 44.1 kHz, 24-bit.

Had it been available to me, a mid-side microphone configuration would arguably have helped yield a more compelling soundscape composition. The polar pattern of the cardioid, XY configuration privileged the central part of the soundstage where the instrument was foregrounded, thereby taking focus away from the very important ambient element of its echoes, which were coming from all around. The omni-directional, AB configuration, covering a wider perspective, achieved a better balance between foreground and ambience, but lacked the clear spatial definition that the XY microphone had achieved. Mid-side recording would have allowed me to record a very wide and precisely defined soundstage without necessarily privileging the centre-foreground.

Photograph 9. Recording site at Kura Tawhiti. The composer positions microphones facing north towards limestone escarpments which are about 200 metres away. Photo: Nick Derrick.

8.4 Performance

The open spaces provided by the landscape at Kura Tawhiti are much larger than those of any indoor location. Unlike the dense and immediate reverberation produced by the chamber at Middle Head, the geography here produces echoes coming from different directions and of varying duration. As with the pieces from the chamber at Middle Head, in *Kura Tawhiti* the location's resonance is understood as being an extension of my instrument and is therefore necessarily negotiated spontaneously. In addition to its geography providing a complex, multi-directional echo system, the location's resonance must be affected also through variations in atmospheric conditions. *Kura Tawhiti* could not therefore have been created in a studio using digital delay, because it is the unpredictability and complexity of the location's resonance, its soundscape and other sensory elements, which provide a unique context for music making.

Kura Tawhiti's echoes respond both to the instrument's different pitches and to the performer's spatial orientation, their activation requiring the instrument to be played with vociferous projection. Soprano

saxophone was chosen for its tonal core being more robust than that of the clarinet which had been used on previous visits. The echoes of longer duration suggest a pulse; this is either played with or played against. Echoes of shorter duration sometimes suggest asymmetrical subdivisions within this pulse, from which different rhythmic patterns can be layered or syncopated.

No particular tonal, rhythmic or structural agenda had been considered prior to this performance; all musical decisions were spontaneous. During the first three minutes my playing suggests the dorian mode as a keynote, using flurries of notes going up and down, focusing on various voicings and inversions based on the note groups [1, 2, ♭3, 5, ♭7] and [1, 2, ♭3, 5, 6], mostly around the instrument's middle register. These flurries occasionally modulate into more sustained phrases from about four minutes into the piece, during which pitch is scooped microtonally. At around 08:30 the keynote dissipates as larger intervals and chromatic tones are used. At around 11:00 the momentum is interrupted by clicks and squeaks which then mutate into sustained, undulating multiphonics. *Kura Tawhiti* ends on a slowly oscillating diminished 5th.

8.5 Editing techniques

Kura Tawhiti was selected from a series of performances recorded during the field trip on May 15th, 2013 because of the sustained momentum of its improvisation, which modulates through several themes and textures. Software intervention was minimal in that it was used only to enhance transmission of the longest echoes, which are of extremely low amplitude and partially masked by the ever present cicadas. In order to bring the echoes further into the foreground I applied upward compression to the recording, thereby boosting the distant, low level signals from the echoes without affecting the direct, high level signal from the saxophone.

8.6 Concluding comments

Kura Tawhiti supports my previous claim that in soundscape composition, resonant spaces must be considered more than just interesting locations in which to record improvised music.

9 Remains

My acousmatic work *Remains* is complimentary to *After Bexley*, a collaborative work conceived and facilitated by sonic artist Sally Ann McIntyre, for her transmission project 'Radio Cegeste'. McIntyre describes 'Radio Cegeste' as:

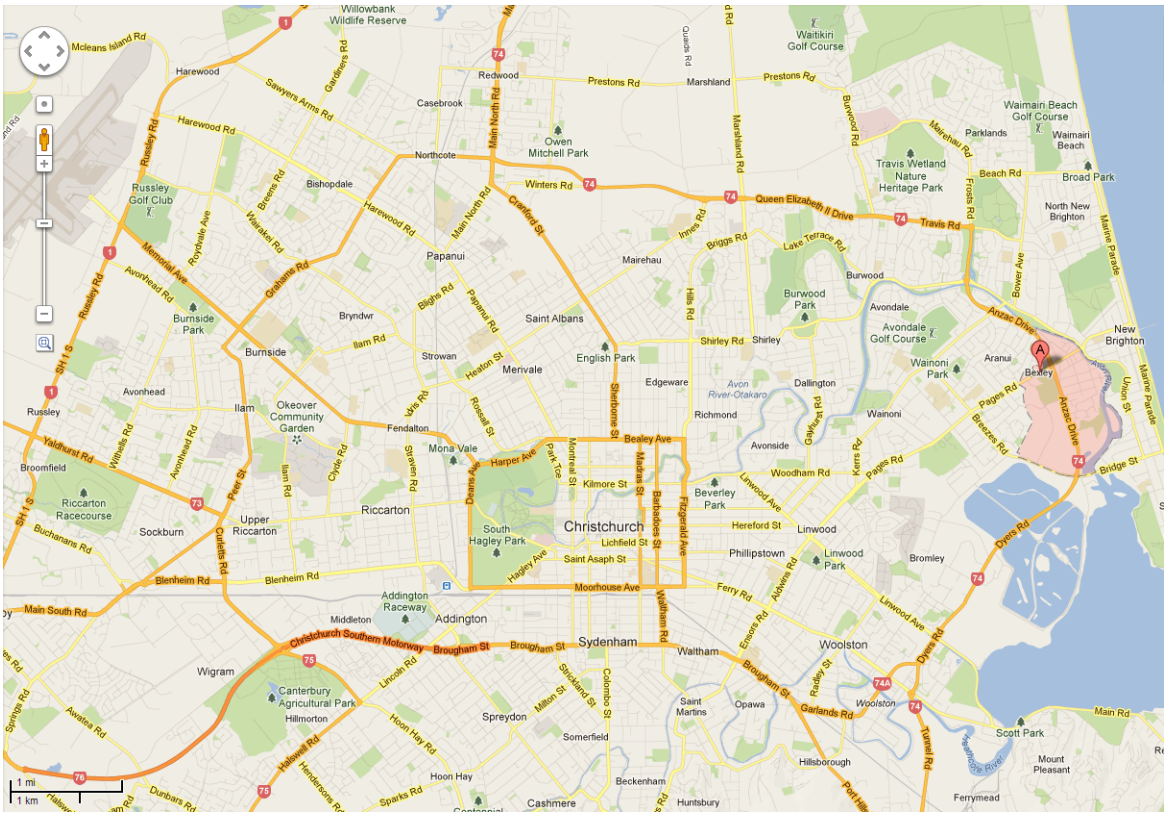
> […] a micro-radio project station built in a workshop with Kogawa in 2006 […] its series of programmes has been developed and performed in bounded spaces, from urban shopping malls, to gardens, to biosecure ecosanctuaries, critically engaging with small radius transmission as a form which, as one commentator put it, "takes field recording back to the field", localising the transmission, and recognising radio as a medium which, while no longer centralised, can see artistic and critical potential in an analysis of place-based specificity, and allowing its environment to 'speak back' as receiver (McIntyre, 2012).

After Bexley was presented as a small radius, FM-radio memorial transmission at The Physics Room, Christchurch, on September 15th, 2012. Transistor radios that had been tuned to receive this transmission were located around the gallery. McIntyre had edited the transmitted sound from recordings we had both made during field trips to Bexley several days earlier on the 11th and 13th of September, 2012. Bexley is one of Christchurch's suburbs most affected by the Canterbury earthquakes of 2010 and 2011 and owing to the devastation has been mostly abandoned. Nature has reclaimed what was once a tidy, modern suburb where now many houses have partially sunk into the unstable ground.

Remains might be listened to simply as an evocative field recording of an abandoned urban site. However, the context of its presentation on *Global Ear (The Wire, January 2013)*, alongside other Canterbury earthquake-themed works and Jo Burzynska's accompanying article, provides an additional level of interpretation; rather than being representational in a general way, *Remains* is my interaction with a very specific soundscape. This interaction focuses on the absence of defining soundscape elements by making hyper-real those other, transient/liminal sounds which are left behind. I am led by my emotional responses to confronting the aftermath of a series of earthquakes I had experienced during the previous two years. These responses are conveyed by juxtaposing perspectives from indoors and outdoors and through highlighting their now overlapping ecologies.

9.1 Location

The suburb of Bexley is built on a low, coastal wetland whose eastern side is bordered by the Avon River. The beach lies less than a kilometre beyond the river and the area is now a high flood risk zone. Since sustaining irreparable earthquake damage, Bexley has been classified by the New Zealand Government as a red zone.[16] The area explored during field trips, south of Wetlands Grove and along Seabreeze Close, is the most recently built and worst damaged part of Bexley and backs onto a wetland wildlife park. Many houses had already been demolished and other precarious structures fenced off. Some abandoned homes were however accessible through broken or unlocked doors, and inside these were damaged appliances, discarded personal belongings and signs of squatting. Gardens were overgrown by weeds and self-sown vegetables.



Map 11. The Christchurch suburb of Bexley is shaded in pink. Source: Google Maps.

[16] The Canterbury Earthquake Recovery Authority stipulates "residential property in the flat land has been zoned red when the land has been so badly damaged by the earthquakes it is unlikely it can be rebuilt on for a prolonged period" (New Zealand Government).

9.2 Acoustic Elements

A striking part of the soundscape in *Remains* is the absence of mundane and familiar residential sounds, such as those produced by TVs, radios, appliances, voices and transport. The absence of these keynotes, signals and soundmarks is of equal importance to other sounds which now penetrate the void, and which in the context of such emptiness, gives them peculiarly melancholic voices. Inside the abandoned homes gusts, howling through broken windows and door frames, activate a squeaking cat flap and rustle plastic bags. Birdcalls from the adjacent Bexley wetland filter indoors as does dampness and colonising plant life. Outside the wind can be heard in overgrown shrubs and grass, buffeting a gazebo canvas and some forgotten wind chimes. The sounds framing this void include the distant barking of a dog and the 'monster breath' from the adjacent highway, whose liminal presence re-enforces the sense of abandonment.

9.3 Field recording

A pair of DPA 4060 miniature, omni-directional were mounted on a wire coat hanger, this allowing for quick and precise positioning and easy movement around the location. The only sound recorded differently was that of the gazebo, when the microphones were magnetically attached to its upper frame, only centimetres away from the flapping canvas. Microphone sources were recorded to a Sound Devices 702 at 44.1 kHz, 24 bit.

Map 12. The recording area in Bexley is shaded in yellow. Source: Google Maps.

9.4 Editing techniques

As with *Poranui*, the construction of *Remains* took place following field work, at which stage separate recordings, which had been made from different positions and at different times, were combined. Selections extracted from these recordings were then gradually balanced, crossfaded and layered using multitracking. A spatial narrative emerged from this editing process, during which I rediscovered my listening experience and, in particular, explored my physiological and emotional responses to the location. The listeners' perception of their location within this narrative modulates between indoors and outdoors; when sounds coming from wildlife are heard from inside, or when indoor objects and spaces are sonically activated by the wind blowing outside through broken buildings and are coloured by the resonant characteristics of the indoor space. Although not technically anthrophonic, but nevertheless unmistakably domestic, the sound of a barking dog, recorded from outside one of the few remaining occupied homes, was processed by both decreasing its amplitude and by applying a low pass filter to it in order to locate it in the distance, thereby signalling that there were indeed still people alive in this wilderness.

Both *Remains* and *After Bexley* explore "[the] momentary articulation of an emptiness, a volume of silences, where the cancellation of "the everyday" allows for a listening more aligned with the experience of wandering, of drift, through the abandoned spaces themselves" (McIntyre, 2012). *After Bexley* was a public memorial event focusing on the re-contextualisation of environmental sounds through radio transmission. This spectral transformation together with the sonic artefacts of the diffusion process are important parts of the work in which "we situate this temporary, shifting soundscape within an ephemeral, fleeting context" (McIntyre, 2012). These distorted sounds reminded one listener of the heavy machinery already being used to demolish other parts of the city. This fits with McIntyre's comment, "[the] site specificity of playback of the 'silences' in question opens up one area of the city's built environment into another" (McIntyre, 2012). By contrast, *Remains* exists as a soundscape composition seeking to draw listeners *into* the location and thereby to confront them directly with its state of transience, which they can then perceive as they wish.

Photograph 10. The author explores Bexley. Photo: Sally Ann McIntyre.

Photograph 11. Bexley interior showing earthquake damage and liquefaction. Photo: Sally Ann McIntyre.

9.5 Concluding comments

This severely affected suburb will eventually be demolished and turned into an ecologically managed parkland. But now this forsaken wilderness has an apocalyptic eeriness, seen through broken walls, collapsed structures, and artefacts from domestic life, slowly decaying amongst the ruins where liquefaction provides a fertile bed for fungi and mosses. *Remains* is a personal response to experiencing such scenes during my work on *After Bexley* and it uses my recordings, edited to convey the transient state of this particular soundscape.

10 Sri Lanka: An island of noises

I first visited Sri Lanka in 2009, for collaboration between traditional ritual artists and New Zealand improvisers. During this time I became intrigued by the island nation's cultures, landscapes, climate, wildlife and sounds, and was determined to explore them further. I have since travelled to Sri Lanka in 2011 and in 2013, specifically to record soundscape compositions. Each visit has allowed me to learn more about its soundscapes, as well as to cultivate and extend my network. Since the civil war ended in 2009 intensive development has started taking place; new expressways connect cities and improvements to dilapidated roads permit access by larger vehicles and allow journeys to be completed more quickly. When driving along the new expressway between Colombo and Galle, on which only cars, buses and trucks are allowed, one can imagine driving through rural Queensland, Australia. For better or worse, things are changing fast as globalisation reaches deep into rural Sri Lanka.

Sri Lanka is an island the size of Tasmania but with a population of 20 million. Its anthrophony varies widely across urban and rural areas; for example, even in many remote locations one can hear piped chanting emanating from rural Buddhist temples before dawn. By day, tuk-tuk and motorcycle engines splutter along narrow, bumpy country roads. In residential areas vendors walk the streets calling out to advertise their services and wares, while zooming tuk-tuks and chattering vehicle horns are heard coming from every direction until late at night. On the main roads ageing Ashok Leyland and Tata trucks and buses snort and roar. These anthrophonies are very different from, and more varied than those in Australasia; due to, in particular, the large numbers and types of vehicles on the roads, the often decrepit condition of these roads and the seemingly erratic way people drive.

In this tropical climate plant growth is vigorous, as is the wildlife it supports; birds, insects, reptiles and mammals are abundant, even in urban areas, where biophony can be heard competing with anthrophony. Variations in the geophony can be observed between different locations and seasons. When I first visited the Knuckles Range during September, 2011, weather conditions were windy and bone dry, but during my second visit in November, 2013, in between daily occurrences of thunderstorms and torrential rain,

running water could be heard everywhere and a more vigorous biophony resonated in the still and humid atmosphere.

These three soundscape compositions from Sri Lanka feature spatial modulation in two distinctive ways. The first composition focuses on sounds moving through space, while the second and third focus on my own movement with microphones through it. All three works contain spontaneous spoken elements, which unwittingly provide signals; some of these were engaged as narrative cues during editing. Sounds in these recordings coming from animals, geological phenomena and voices can draw to mind some of Futurist composer Luigi Rusollo's "six families of noises"[17]. Ironically, due to the old ways of life they portray, many of the sounds in my Sri Lanka recordings represent the past rather than the future. As with my compositions from Kura Tawhiti, Sydney Harbour and Hinewai Reserve (*Cicada* excepted), the narratives in the Sri Lankan pieces focus on my spontaneous engagement with location; time is linear and the extent of further intervention during editing is to create a temporal frame around these narratives. In *Sinharaja Sound Walk* there is an exception when time is compressed by removing segments from the recording in order to sustain focus on the unfolding narrative. By contrast, *Poranui* and *Remains* construct narrative by choreographing sounds through distortion and fragmentation of the temporal and the spatial.

[17] Luigi Russolo's futurist manifesto *The Art of Noises* (1913) was written in a letter to his friend, futurist composer Francesco Balilla Pratella. This manifesto outlines six families of noises for the 'futurist orchestra'.

10.1 Locations

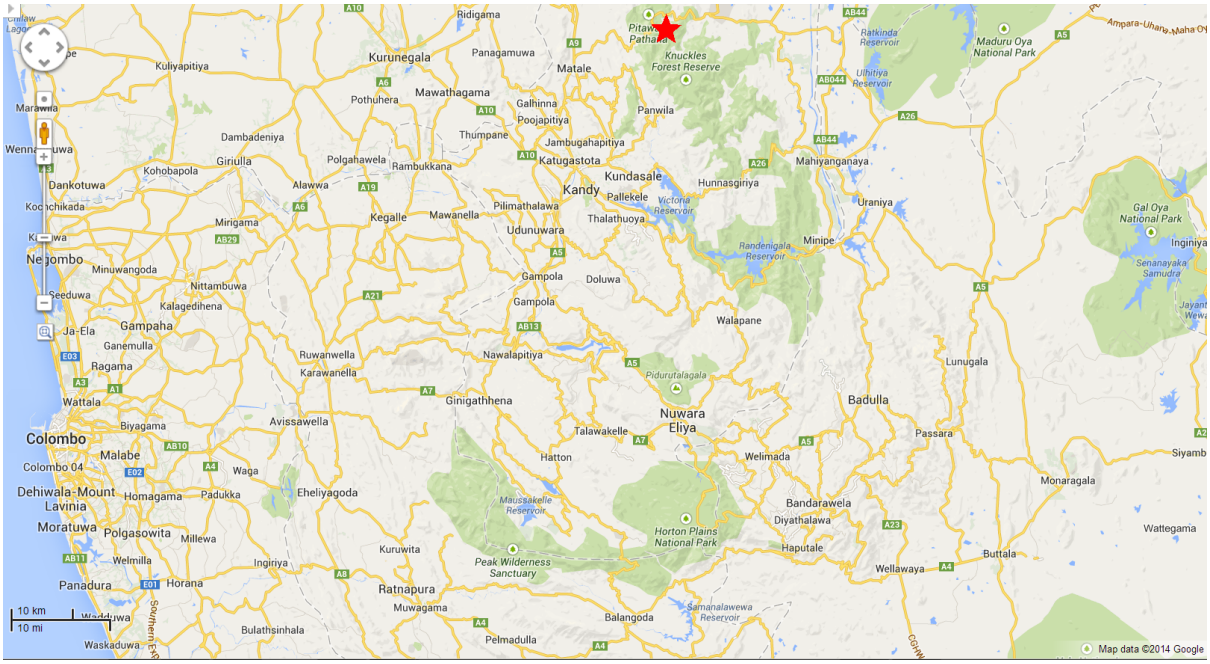
The two locations featured in this set of compositions are Udasiya, a village in the Knuckles Mountain Range and Sinharaja Forest Park, a UNESCO Biosphere Reserve. I visited these locations without any pre-conceived compositional strategies, but rather with an intuition that their soundscapes would present unfamiliar and intriguing biophonies, geophonies and anthrophonies, more varied, spectrally complex and unpredictable than those I had experienced during my previous visits to Sri Lanka.

Udasiya

Udasiya is a remote mountain village in Matale District, central Sri Lanka. Owing to its surrounding geography it remains isolated from the outside world in many ways, but since Sri Lanka's capital city Colombo has become a globalised metropolis, younger generations have begun leaving such provincial settlements as Udasiya in order to pursue modern lifestyles in the city. Villages once thriving deep in the jungle have, in recent decades, been abandoned, but Udasiya, despite having road access, is a rare example of a place where an old, largely independent and sustainable way of life still exists, with only some of its seventy houses being connected to the electricity grid and almost no foreign language known. In addition to a gradual decline in the local population, members of the Colombo bourgeoisie are buying up blocks of surrounding land for building palatial holiday homes and their attitudes towards traditional local ways are not always friendly. Consequently, communities like Udasiya, together with their unique soundscapes, may cease to exist in the not so distant future. However, documentation of endangered cultures and their sounds is a valid incidental to my main objective of soundscape composition.

I was able to visit Udasiya through the Abode Trust, a "not-for-profit organisation based in Sri Lanka which offers eco-tourism as a way of funding its work with people who live traditional lives in remote villages" (The Abode Trust, 2008). "We work with local people–learning about, enhancing and respecting each other's way of life" (The Abode Trust, 2008). My guide, Sidantha Elikewela, was enthusiastic about my proposed field work and agreed to explain to the locals, with whom he has a close personal relationship, what I was doing and to seek their consent. Four days were spent at a homestay

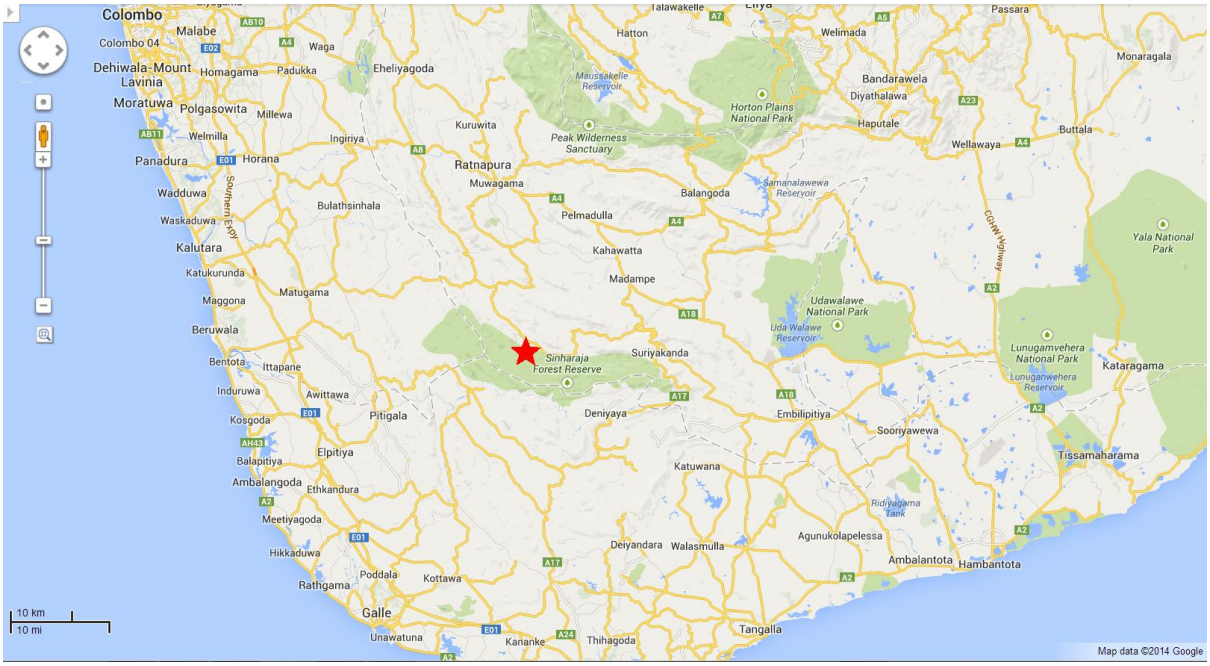
with Elikewela's 'surrogate grandparents', whose welcoming hospitality, traditional cooking, jungle walks and good humour made for an enchanting visit. It can be difficult to know how to best reciprocate serendipitous, cross cultural performances, however, in this instance I was glad to be able to assist a flute player, who can be heard in one of my works, with the purchase of a wheelchair.



Map 13. Location of Udasiya, Matale District, Sri Lanka, is indicated with a red star. Source: Google Maps.

Sinharaja

Sinharaja Forest Park is an 8,864 ha World Heritage site, located in Sri Lanka's southwest wet-zone and its high endemism makes it a significant international resource. Visitors to Sinharaja are required to hire an official guide and include scientists, bird watchers and adventure walkers. During my one-night visit I discovered that the location's diverse eco-systems, together with its changeable weather conditions, produce complex soundscapes whose abundance make Sinharaja well worth further exploration and engagement.



Map 14. Location of recording site at Kudawa, Sinharaja Forest Park, Sri Lanka, is indicated with a red star. Source: Google Maps.

10.2 Buffalo Harrowing

Buffalo Harrowing focuses on sounds produced by the harrowing of a rice paddy on a steep hillside, some 15 minutes' walk from Udasiya and was recorded at around 9:30 am on November 26th, 2013. This composition creates a particular perspective encompassing the soundscape's spatial and spectral dynamics. Sounds coming from the hooves of two water buffalo splash through mud as they pull an ancient plough[18], driven from behind by the farmer's directive vocalisations; sharp hollers and abrupt grunts punctuate the rise and fall of his otherwise melodious calls, subtly reflected by boulders scattered on the hillside. The spatial focus is on the rotation of these sounds as they move together in rhythmic cycles and the spectral focus is on their inner complexities, vibrant in the warm, humid air. Ambient soundscape elements are the barely perceptible birdcalls from further up the hill where thick jungle meets the cultivated field, also the distant noise of running water which can be located towards the left.

[18] The locals refer to this as harrowing.

Photograph 12. Buffalo harrowing near Udasiya, Matale District, Sri Lanka. Photo: Isuru Kumarasinghe.

Buffalo Harrowing begins with the farmer's undulating and sustained call coming from the right. This sound occurs every time a turn-around is made in the tight corners at the far side of the paddy. The procession moves into the foreground and then passes from right to left, within five metres of the microphone array. It then moves further away, making a second turn before crossing from left to right (See Figure 2). The beasts are coaxed onwards by the farmer, whose voice expresses a purposeful repertoire of pitch contours, phrase shapes, timbres and dynamics. As these clockwise rotations spiral inwards into shorter cycles, their duration, in general, becomes perceptibly shorter, in spite of several brief pauses along the way. Once six rotations have been made, a longer pause in the harrowing gives way to a conversation in Sinhala. At this point a hitherto verbal liminal element comes into focus, in which an ancient system of subsistence farming is described, surviving only because the landscape is not accessible to machinery. More than one listening to *Buffalo Harrowing* may be required to fully comprehend this liminal element, presented by the voice of our guide Sidantha Elikewela, who is conversing with my companion Isaac Smith, in English, from behind the microphone; however, it can equally well be perceived as abstract sound. The piece ends when Smith comments on his attempt at walking through the mud. This composition conveys the visceral dimension of sounds whose logic is

apparent in their spatial modulation. *Buffalo Harrowing* incidentally acknowledges the dignity of a culture sustained by an ecologically balanced cultivation system.

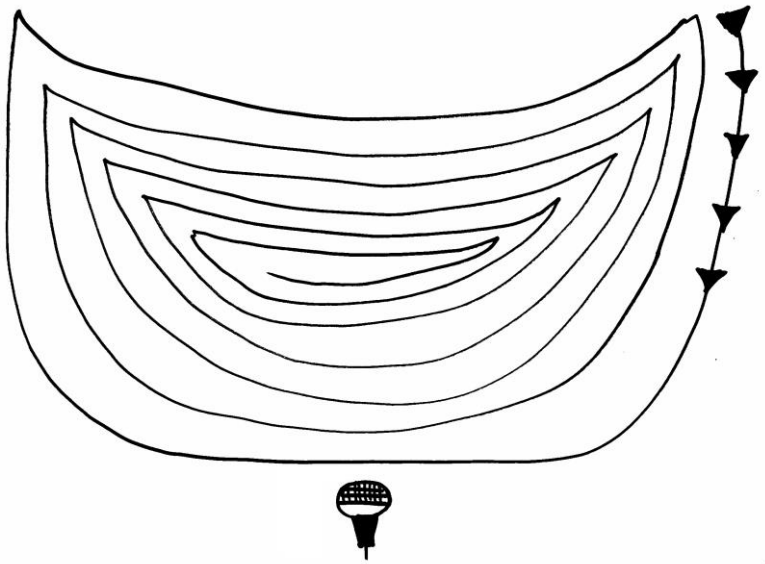


Figure 2. Path and direction of harrowing sound sources in *Buffalo Harrowing* indicated by single line and arrows. Relative recording position indicated by a cartoon microphone.

Sennheiser MKH 30/40 microphones in mid-side configuration were mounted on a tripod on a patch of firm ground adjacent to the paddy. A windscreen was used without its fur cover. These sources were recorded to a Sound Devices 702 at 44.1 kHz, 24-bit.

10.3 Udasiya Sound Walk

Udasiya Sound Walk took place at dusk on November 25th, 2013. Unlike *Buffalo Harrowing*, which focuses on one specific soundscape perspective in order to observe a series of related events, *Udasiya Sound Walk* modulates perspective by traversing a soundscape of disparate events. The microphone's movement through the resonating landscape can be sensed as sounds sustained and isolated, stationary and mobile, coming from different directions and sometimes from all around, shift in and out of the foreground. Figure 3 provides a timeline for these events, categorising them as either *isolated*, *sustained* or *changing sustained*. Isolated events usually last for only a few seconds, their beginnings and ends clearly defined and are distinguished by a contrast in their spectral characteristics to concurrent, sustained events. Isolated events are often unpredictable and likely to constitute signals. Sustained events are either continuous textures, sometimes the result of many repeated events coming from similar

sources, or frequently and predictably recurring sounds. Sustained events can constitute soundmarks or keynotes. Changes in sustained events can be perceptual or actual; for example, perception of a sound can change as a result of the microphone being moved, or the spectral elements can change at the sound's source. The timeline also indicates spatial modulation from the perspective of the microphone and provides durations for its state (moving or stationary). My walk begins in the village's main thoroughfare where six sounds present themselves during the first fifteen seconds (my footsteps, pigeons, running water, frogs, voices and flute). Following a rooster's unexpected fanfare, the soundscape gradually shifts as I move into a more jungled area. Here the enveloping percussion of tree frogs replaces the cooing of pigeons as the jungle's biophony starts to modulate into its nocturnal phase. In the background transient voices of people ambling home, hammering, farm animals and bird calls, carry in the still, humid air. After lingering here for nearly six minutes I cross a bridge and pass a group of villagers. Many sources of running water can be heard here; their speeds, distances, directions, and volumes creating an assortment of timbral shades, all shifting in relation to the moving microphone. As I move closer to a scattering of houses, melodious calls are heard between two far away children, obviously communicating over a distance as their distinct pitches come from slightly different directions.

Cue	Isolated events	Sustained events	Changing sustained events	Moving microphone / Stationary microphone
00:00	Foreground: composer's footsteps (only when microphone is moving) Background: pigeons, running water and tree frogs			01:57
00:07	Background: intermittent flute			
00:15	Background and foreground: voices			
00:26	Foreground: rooster crows			
01:15	Tree frogs and running water modulate into the foreground			
01:45	Foreground voices recede into the background			
01:58				05:58
02:51	Background: rooster crows			
05:34	Background: hammering			
06:08	Background: water buffalo moo			
07:57	Multiple sources of running water are heard coming from different directions and distances Tree frogs modulate into the background			02:30
08:25	Foreground: voices			
08:56	Background: recorded music			
09:15	Tree frogs modulate into the foreground			
09:23	Foreground: water buffalo moo			
10:00	Running water modulates into the background			
10:28	Background: individual voices are heard moving in different directions			02:36
11:23	Background: children's voices			
13:23	Foreground: voices			00:31
13:36	End			

Figure 3. A timeline of *Udasiya Sound Walk*, showing soundscape events and microphone states.

The temporal frame I created for *Udasiya Soundwalk* excludes about five minutes from the recording. This is because soundscape events occurring during the first 30 seconds inside the frame make for a compelling start to the piece. In the same way, Isaac Smith's amused comment on my appearance provides a strong ending.

For *Udasiya Soundwalk*, I carried Sennheiser MKH 30/40 microphones, in mid-side configuration, which had been mounted in a windscreen without its fur cover. These sources were recorded to a Sound Devices 702 at 44.1 kHz, 24-bit.

10.4 Sinharaja Sound Walk

Sinharaja Soundwalk took place just before dusk on December 4th, 2013, immediately inside the Kudawa entrance to Sinharaja Forest Park. This composition provides a more intense, slow paced, musical experience than those compositions from Udasiya, by focusing on the "unearthly" sounds produced by the jungle during a thunderstorm. Like *Poranui* this piece should be diffused at high volume to encompass its dynamics. I begin *Sinharaja Soundwalk* at the unattended ticket desk, with my companion Isuru Kumarasinghe and our guide, following the track alongside marshland and into the jungle.

The opening sixteen seconds provide enough time to establish a scene set by the ambience of trickling water and a high-pitched insect drone. A sudden roll of thunder culminates in a devastating clap, echoing far across the landscape and apparently provoking sounds from other wildlife: birds start to chirp and frogs oscillate and rattle. More distant rolls of thunder occur throughout the soundwalk. As the microphone is moved deeper into the jungle, the biophony's palette can be heard shifting when the insect drone crescendos into an oppressive wall of sound and the frogs and birds are left behind. My footsteps, carefully crunching through gravel, pursue a recurring, eerily mesmerising sound, half death-rattle half blade saw, rising and falling with a quivering shake. This stridulation of crickets is as intriguing now as it was before I knew its source, its strange complexity demanding full listening focus. We remain still for some time once we arrive near the source of this sound, which after several minutes retreats into the ambience, while the high drone becomes even louder. The first spoken words in the composition occur three quarters of the way through, when I ask what had been making the extraordinary sound. A decision is then made to return the way we had come, due to the imminent rain. The rain begins to fall upon the surrounding foliage, whose many large leaves resonate like drum skins, this sound replacing the previously ubiquitous, piercing insect drone. Footsteps, more brisk than they had been on the way in, take the microphone on a journey back to the location where the walk had

begun. The frogs and birds are still acoustically active as we re-traverse their area in the rain. The composition ends with a minute of standing beneath some huge leaves and a final roll of thunder.

Like the other Sri Lanka pieces and many more of my soundscape compositions, *Sinharaja Soundwalk* uses a temporal frame to draw narrative from a spontaneous chain of events. However, in order to help the narrative cohere three more temporal interventions are made within this frame. The first of these occurs during the walk into the jungle, when a five minute segment is removed from the recording because it does not contribute to the narrative. The separated segments, whose adjacent ends are spectrally similar, are then crossfaded between 04:28 and 05:06, resulting in a transparent temporal jump. The second intervention at 15:19, when several more surplus minutes are cut from the recording, is cued by the conversation, in order to create an abrupt jump into the aforementioned rain. The third intervention is similar to the first and occurs towards the end, between 17:18 and 17:40.

This is the only recording I made in Sinharaja Forest Park because the following morning I was informed by forest department staff that special permission is required to record sound in the reserve. A subsequent walk without my microphones confirmed my prediction that this is a place full of soundscapes affording sustained engagement.

In *Sinharaja Soundwalk* DPA 4060 miniature omni-directional microphones had been mounted on wire coat hanger in A-B formation with wind covers. These sources were recorded to a Sound Devices 702 at 44.1 kHz, 24-bit.

Photograph 13. Late afternoon at Sinharaja Forest Park. Photo: Isuru Kumarasinghe.

10.5 Concluding comments

These compositions could be perceived as anthropological field recordings, particularly in so far as some of their featured sounds, together with their cultural contexts, are endangered. Nevertheless, they are distinctly conceived as musical works because they all manifest through my spontaneous engagement with serendipitous events. While I do not dismiss any documentary value they may have, it is intended that they should be presented as soundscape compositions.

Conclusion

> I strongly believe that any sound can *be* music, but not that [it] *is* music. The essential difference, what converts a sound into music, is a human, subjective, intentional, non-universal, not necessarily permanent, aesthetic, *decision*. And this does not mean composition, nor academic definition, but a way of perceiving certain sounds in a certain time by a certain person (López, 1996).

For me, López's claim is compelling in that it supports my conviction that soundscape composition is dependent on those soundscapes which prompt decisions to musically engage. Four important aspects of soundscape composition which affirm this conviction, are revealed by the analyses in Part II:

1. How soundscape composition manifests
2. Exploring the temporal
3. Exploring the spatial
4. How the listening subject and the acoustic agent are two sides of the same coin

My approach to soundscape composition focuses on these aspects in prescriptive, spontaneous and retrospective ways. In the introduction I claim that this body of work represents a significant stage in my musical development; this significance is demonstrated by a unique, intuitive approach to soundscape composition which allows me to work without systematic musical constraints. Instead, locational contexts present environmental constraints which are fluid, responsive, complex and unpredictable. To negotiate such constraints one must constantly re-define strategies and question perceptions. In Part I, exploration of different philosophical, practical and aesthetic positions provides a foundation whose terms have proved to be essential for analysing soundscape composition. This exploration also provides strategies that help me approach soundscape composition in a way where perception and decision engage serendipity.

How soundscape composition manifests

In Chapter 1, I discussed three developmental phases in my soundscape compositions: context, fieldwork and editing. It is within these phases that my compositional approaches are revealed.

The first compositional approach can be defined in three ways: hyper-real—when particular acoustic features are exaggerated, distorted or presented in different combinations; soundwalks—when the microphone is moved through space in order to create a compositional narrative; instrumental performance—when the composer and/or collaborators use their sonic abilities to illuminate space and interact with it as if it were an extension of their instrument.

The second compositional approach concerns perception. I use the terms micro and macro to describe the relative amplitude of sounds as they are perceived and may interact in the field and subsequently how this perception may be transformed. This is crucial when using the microphone to spatially compose sound sources in order to foreground a particular ecological, semantic or musical characteristic. Ambience is a term I use in reference to the entire, acoustically illuminated space which may encompass both micro and macro sounds. Although it contains micro and macro sounds, this illuminated space always remains as the context for them.

The third compositional approach is the use and interaction of the microphone and musical instruments. The microphone is at the heart of all my soundscape compositions as an instrument in its own right. The microphone's transformative qualities, rather than being considered obstacles to the reproduction of sound, are instead understood as musical contrivances to be engaged with creatively. Conventional musical instruments are understood as acoustic illuminators available to me and any collaborators (that is acoustic agents), should we wish to express our own acoustic presence as a way of engaging with the soundscape. Such engagement can involve responding to environmental sounds, using the landscape to create one's own acoustic reflections, or a combination of both. Most important are one's musical, physiological, cultural and biological sensitivities to the location, which determine firstly, whether or not to play at all and secondly, how this acoustic intervention in the field might be realised. In my works musical instruments are always carefully sited in relation to the microphone.

One of the most exciting parts of soundscape composition is serendipity. This became especially evident while exploring soundscapes in the degraded but slowly recovering ecosystems of Hinewai Reserve. At times when I attempted to plan my field work carefully, my musical expectations were seldom fulfilled.

Instead, all of the Hinewai pieces are the result of my having been in the right place at the right time. *Kura Tawhiti*, on the other hand, required careful planning and experimentation, specifically to feature the location's echoes. Here, the technical aspects of field recording had been somewhat prescribed during the course of previous visits and they continue to present challenges. However, for the saxophone performance, intuition and spontaneity were crucial elements in order to maintain its momentum in the context of the location's profoundly idiosyncratic resonance. A very different compositional strategy however, might have emerged had I attempted to work at Kura Tawhiti during windy weather.

The pieces from Middle Cove focus on indeterminate soundscape events and include spontaneous, abstract and intermittent instrumental responses to these events. Then, through the process of playing back what the microphone had captured, their temporal frames are created retrospectively. By contrast, the temporal frames of the Middle Head pieces are spontaneously defined through sustained instrumental performances, which emerge from the predictable context of an underground, concrete chamber.

Remains evokes emotional responses by strategically focusing on the transient context of a recently abandoned suburb. Here, the process of field recording is one of exploration and contemplation, while editing focuses on the sounds in a more abstract way, in order to create a narrative in which both outdoor and indoor perspectives are made to overlap.

The Sri Lankan soundscape compositions are arguably the most spontaneous of my works while *Poranui* is the most contrived. Especially from experiences during my earlier visits to Sri Lanka, I had learned to avoid working too prescriptively. Therefore, the only expectations I had during my most recent 2013 visit to Sri Lanka were that its soundscapes might be very different from those I had experienced during previous visits and certainly very different from those in New Zealand and Australia. In addition, my now more developed technical expertise and listening awareness allowed me to work more spontaneously. The Sri Lankan pieces are the result of my being able to spend several days at a time exploring, lingering, eating and sleeping in very active soundscapes, all the while 'listening in readiness' and being prepared to start recording spontaneously. By contrast the

compositional strategy for *Poranui* was devised after the first of three field trips to the location and subsequent trips were planned specifically to record soundscape elements required to complete the work.

Exploring the temporal

Most of my works create a temporal frame around a particular sequence of events. This frame is defined either spontaneously (for example in *Kura Tawhiti,* by a sustained instrumental performance) or retrospectively (for example, in the pieces from Middle Cove, by indeterminate soundscape elements which are interpreted as structural cues during editing). Some of my works distort or fragment time and this occurs in various ways. *Poranui* creates a seamless illusion of spatial traversal by combining fragmented temporal segments, either in parallel, in series or in a combination of both. *Remains* also combines fragmented temporal segments, but unlike in *Poranui,* this technique is used to abruptly present different perspectives. In *Cicada,* segments of linear time are slowed down, thereby abstracting soundscape elements through the revelation of their inner dimensions. Two of the temporal interventions made in *Sinharaja Soundwalk,* remove superfluous segments and a further intervention removes a segment in order to highlight spectral change in the soundscape, thus enhancing the narrative.

Exploring the spatial

My soundscape compositions engage with space in different ways: by using the microphone to perceive extreme spatial perspectives; to perceive how space is illuminated by my own sounds; to perceive how sound sources move; and to perceive space from the perspective of the microphone as it is moved through the space.

Hidden, or otherwise inaccessible sound sources, can be intriguing precisely because their unfathomable syntactical dimensions challenge our comprehension. The foregrounding of such sounds is one way the listener can be released from the constraints of referential and strategic magnitude. My use of miniature microphones in *Wild Bees* allows the insects, together with the subtones and breath sounds of my soprano saxophone, to be perceived in the extreme foreground and thus from a perspective which would not have otherwise been possible. *Beech Umbrella, Cicada* and *Clarinet and Trickles* all use extreme

perspective to contrast micro-sounds with their surrounding ambience. In *Poranui* the microphone is used in extreme proximity to shifting pebbles, whose sonic texture and spatial dynamics would have been much less clear from even a slightly more distant perspective.

Two of my compositions use particular microphone configurations in order to convey the movement of sound sources: in *Buffalo Harrowing* microphones are located as close as possible to the subjects' perimeter of movement; in *Clarinet Drone and Trumpet Pops,* the improvised performance climaxes where the clarinet spontaneously moves towards one of the microphones while the trumpet moves away into the distance. The relatively quiet space in *Kura Tawhiti* is illuminated by and engaged through my own sounds. As Truax comments:

> The listener cannot tell if the voice is activating the space, or if the vibration of the space is activating the resonances of the body. In such a situation, sound mediates a *unity* between self and environment. Language creates a division between the two concepts; acoustic experience in which the human sound is reflected back to the listener imbued with the image of the environment unites them (Truax, 2001, p. 38).

Udasiya Sound Walk and *Sinharaja Sound Walk* focus on the metamorphosis of spatial perspective caused by the microphone being moved through different parts of the soundscape.

How the listening subject and the acoustic agent are two sides of the same coin

My acoustic presence in the recorded environment is important even when it is incidental. For example, my footsteps in *Sinharaja Sound Walk* both affirm the traversal taking place and provide elements of texture and pulse. Even when I am apparently absent, my presence manifests as artefacts both of the listening subject (through my recorded perceptions of the soundscape) and the acoustic agent (through my retrospective electroacoustic interventions); for example in *Poranui, Remains, Beech Umbrella* and *Cicada.* This manifestation highlights how the listening subject and the acoustic agent are two inseparable halves of the soundscape composer.

I have used sound recording and editing technologies to enhance my listening, thereby allowing me to produce works conveying the acoustic immediacy of place, while simultaneously re-contextualising my

listening experiences and drawing narratives from them. All of this leads to a consideration of how soundscape compositions can be diffused.

Diffusion

> What I love about my work is that I when I go on location there's only me who can hear the world in that particular way at that moment, you tune into the world in your own unique way—you can't share that with anyone on location, because you have headphones on. So I like that aspect of it, I like the solitary aspect of it, selfishly. It's sort of like a retreat. But what I also like is to play them back to people directly and then rework them (Watson, cited in Crawford, 2013).

Chapter 1 presented a quotation from Jez Riley-French in which he describes his passion for sharing his field recordings with the public, especially at that "moment when everything works and the audience becomes part of the music itself" (Riley-French, cited in Lane & Carlyle, 2013, p. 161). I share Riley-French's view that the audience is a crucial part of the music making process, especially from the perspective of being a performer. Both public concerts, where a certain listening etiquette is assumed by the audience and more intimate, shared listening sessions are compelling ways to present my soundscape compositions. Some works, especially those with dramatic dynamics like *Poranui* and *Sinharaja Sound Walk,* are best presented using a fine tuned, high powered loudspeaker system. Although some venues can present challenges such as excessive room resonance or external sounds causing interference, assuming personal responsibility for diffusing my works allows me to make spontaneous interventions to volume, equalisation and even to the structure of composition itself. All my soundscape compositions can be listened to in private, by using either headphones or a strategically positioned loudspeaker system. Most of my works can be appreciated online, but those of a particularly long duration or with extreme dynamics, such as *Poranui, Broucherie's Road Pond, Kura Tawhiti* and *Sinharaja Sound Walk,* demand more from the listener and may present better in more focused listening contexts. However, the burgeoning market for high quality music streaming may provide a more dynamic context for all my compositions. Public radio broadcasts however could be problematic where the ambient noise floor is likely to be too high in many listening environments.

In addition to diffusing my compositions through recordings and concerts, a future means of diffusion might be through sonic installations; these could use multi-channel speaker systems, or encourage listeners' intervention, or engage other inter-disciplinary collaboration. Installations would, however, require a radical re-contextualisation of recorded space. Furthermore, they would necessitate exploring other levels of temporal engagement in ways suggested by Australian artist Ros Bandt:

> The temporal aspect of sound installation distinguishes it from other audible genres because the works are intentionally installed for much longer durations, inviting numerous visits. Sound installations do not necessarily remain the same over the period of installation, be it a few days, weeks or months. They can be ephemeral, temporary, or semi-permanent, engaging with the perception of time in creative ways (Bandt, 2006, p. 354).

Diffusion, then, is far more than a mere practicality or technical consideration and does not necessarily have to be prescribed. Salome Voegelin states:

> […] I believe the future of field recording lies in the tension created by transforming the heard through participation, collaboration, expansion and play, through which we can try a humbler humanity of shared spaces, and renegotiate what is real (Voegelin, 2014).

Such transformed recordings are at the very heart of soundscape composition.

A return to the 'proto orchestra'

Bernie Krause offers a cogent argument that the origins of language and music are to be found in the 'proto orchestra' of pre-historical soundscapes (2012). This beckons the hypothetical question of how might pre-historical musicians engage with the very different soundscapes surrounding us today. This question is answered from the perspective of a contemporary musician when I claim that our physiological function to 'make sense' of sound is at the core of musical practice and appreciation.

As a species of acoustic communicators, and in particular one of musicians, we need to reinstate a now rapidly changing proto orchestra into the foreground of our perceptual and creative lives. This is important, not as a means by which to embalm or immortalise dead or dying soundscapes, nor yet of absorbing interesting sounds and contexts into an intellectual praxis, but rather as a tangible, intuitive and creative way of contemplating our existence through soundscape composition.

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Appendices

Appendix I—CD track listings

Note: all tracks have been produced for playback at a high volume level in order to encompass their full dynamic range

Disc 1 of 4 (Banks Peninsula)

1. Poranui..... 10:47
February 2012.
From recordings made at Birdlings Flat, Canterbury on 17/11/2010, 17/01/2011 and 02/07/2011

2. Cicada..... 09:59
February 2014.
From recordings made at Hinewai Reserve on 18/02/2012

3. Broucherie's Road Pond 14:54
February 2014.
From a recording made at Hinewai Reserve on 30/12/2013
Trumpet: Joseph Derrick; soprano saxophone: Reuben Derrick

4. Beech Umbrella 12:02
February 2014.
From a recording made at Hinewai Reserve on 30/12/2013

5. Pensive..... 06:07
September 2013.
From a recording made at Hinewai Reserve on 19/02/2012
Soprano saxophone: Reuben Derrick

6. Wild Bees 05:29
September 2013.
From a recording made at Hinewai Reserve on 18/03/2012
Soprano saxophone: Reuben Derrick

Disc 2 of 4 (Sydney Harbour)

1. Clarinet, Trumpet, Birds, Walkers and Plane 14:04
2. Clarinet and Trickle..... 03:17
3. Clarinet, Trumpet and Cicadas..... 07:39
August 2013.
From recordings made at Middle Cove, Sydney Harbour on 05/02/2013
Trumpet: Joseph Derrick; soprano saxophone: Reuben Derrick

4. Rust, Cavity, Breath, Stillness, Motion..... 14:54
5. Clarinet Drone Trumpet Pops..... 04:10
6. Wall of Sound..... 06:17
August 2013.
From recordings made at Middle Head, Sydney Harbour on 04/02/2013
Trumpet: Joseph Derrick; soprano saxophone: Reuben Derrick

Disc 3 of 4

1. Kura Tawhiti..... 17:41
September 2013.
From a recording made at Castle Hill, Canterbury on 5/05/2013
Soprano saxophone: Reuben Derrick

2. Remains 11:12
November 2012.
From recordings made at Bexley, Christchurch on 11/09/2012 and 13/09/2012

Disc 4 of 4 (Sri Lanka)

1. Buffalo Harrowing..... 09:47
January 2014.
From a recording made near Udasiya, Matale District, Sri Lanka on 26/11/2013
Voices: Sidantha Elikewela, Isaac Smith and others

2. Udasiya Sound Walk..... 13:41
January 2014.
From a recording made at Udasiya, Matale District, Sri Lanka on 25/11/2013
Voices: Isaac Smith and others

3. Sinharaja Sound Walk..... 18:55
January 2014.
From a recording made at Sinharaja Forest Park, Sri Lanka on 04/12/2013
Voices: Isuru Kumarasinghe and Reuben Derrick

Appendix II

Concerts and performances

28th September 2011	*Poranui* (early version) and *Above Hinewai*, presented at a public composition workshop, University of Canterbury School of Music
7th September 2012	*Poranui* (revised version), presented at New Zealand Electroacoustic Music Symposium, Wellington
15th September 2012	*After Bexley*, Radio Cegeste's radio memorial, performed at The Physics Room, Christchurch
1st October 2012	*Lovesick Whales in Sydney Harbour*, presented at Suspended Resonance, the Platform Arts Festival, University of Canterbury School of Music
5th June 2013	*Continuum*, collaborative work with Chris Reddington, presented at Borderline Listening Post launch, Lyttelton
14th–20th August 2013	*Continuum*, featured at Borderline Listening Post, Lyttelton[19]
21st March 2014	DMA concert at The Auricle, Christchurch (see below).

[19] See http://cssa.org.nz/the-borderline-listening-post/


UC
UNIVERSITY OF CANTERBURY
Te Whare Wānanga o Waitaha
CHRISTCHURCH NEW ZEALAND
Field recordings from New Zealand, Australia and Sri Lanka using experimental microphone techniques, sound-walks and improvised performance explore the visceral dimension of sounds while at the same time sustaining their environmental context.
acoustic illuminations
an acousmatic concert of soundscape works by
reuben derrick
friday 21 march 8:30
35 new regent street
THE AURICLE
SONIC ARTS GALLERY
a School of Music DMA concert

Acoustic Illuminations

An acousmatic concert of soundscape works by Reuben Derrick
8:30pm, March 21, 2014, The Auricle Sonic Arts Gallery, 35 New Regent St., Christchurch

This concert presents a selection of soundscape compositions from locations in New Zealand, Australia and Sri Lanka. My Doctorate of Musical Arts research charts a zone between the referential and the abstract in which the visceral dimensions of sounds are explored while at the same time their environmental context is sustained.

These compositions feature places that are illuminated by sounds emanating from both within and around them. The essential musicality of such places affords creative engagement through listening and acoustic participation. Listening is enhanced through field recording, for instance during sound walks or when the microphone is used to convey extreme perspectives. Improvised performance, both solo and collaborative, allows me to further interact with the soundscape and thereby find ways of illuminating its acoustic space. Field recording and subsequent editing define spatial and temporal frames around specific parts of these soundscapes, thereby supplying the means by which composition coheres. Structure in these acousmatic works is also shaped by my physiological and emotional responses to places as they are being explored.

Poranui

Poranui reveals voices of the sea at a place otherwise known as Birdlings Flat. The composition emerged through the process of recording soundscape elements and through subsequent playback and editing of these recordings. *Poranui's* spatial narrative evolved when field recordings using different spatial perspectives were extracted, combined and filtered. In this narrative the listener is transported from the backshore, across the foreshore and finally down into crashing water and shifting pebbles of the nearshore. The visceral proximity of voices emerging from this soundscape gradually envelops the listener, whose auditory system insists that they are being dragged deep into a hazardous environment. The expressive nuances of these voices are re-contextualised in various permutations, thereby allowing the listener's initial perception of a referential soundscape to shift towards a hyper-real, even abstract musical experience.

Sydney Harbour

These pieces feature locational improvised performances by Joseph Derrick on trumpet together with myself on clarinet. Sydney Harbour differs from Birdlings Flat, in that it encompasses urban, industrial, maritime and bush environments, where acoustic elements overlap, compete and combine. These pieces reveal a delight at being intertwined with this acoustic ecosystem, a position that allows environmental sounds to be free from compositional contrivance and thus bypass the need for their musical justification or resolution. Environmental sounds are considered in relation to their sources, their ecologies, their locations, their textures, their pitches, their rhythms, their patterns, together with our emotional responses to them. *Sydney Harbour* engages two very different locations; the first is a sheltered nature reserve at Middle Cove and the second is inside a historical, military fortification at Middle Head. The difference between these soundscapes is heard through the more referential orientation of the first and the more abstract nature of the second.

Sri Lanka

I first visited Sri Lanka in 2009 for collaboration between traditional ritual artists and New Zealand improvisers and I was intrigued by the people, landscapes, climate, wildlife and sounds, which I determined to explore further. I have since travelled to Sri Lanka specifically to record sounds, to extend my network and to discover locations with compelling acoustic ecologies.

This set of works focuses on spatial modulation in two different ways: the first features sounds, which are themselves moving through space and the second and third feature soundwalks, in which unfamiliar environments are spontaneously explored. All three pieces contain elements of sometimes unwitting, spoken narrative; they could be understood as anthropological field recordings but are distinctly conceived through the ears of a musician. These pieces engage two locations; Udasiya is a remote mountain village in the Knuckles Mountain Range and Sinharaja Forest Park is a UNESCO World Heritage area in the lowlands.

Buffalo Harrowing and Sound Walk in Udasiya Village

Udasiya is a rare example of a place where a very old, largely independent and sustainable way of life still exists, although now threatened by development. These recordings convey visceral evidence of an ecologically balanced system and the dignity of a culture it sustains.

Buffalo Harrowing features the harrowing of rice paddies on the steep hillside, with the liminal element of our guide's voice in the background describing this ancient system of subsistence farming. In the foreground the hooves of two water buffalo splashing through mud, together with the farmer's directive vocalisations, are heard rotating through space in rhythmic cycles. The inbuilt logic of these patterns, along with the unwittingly performative qualities of their representative sounds, provides musical structure.

Udasiya Sound Walk occurs at dusk as the villagers return home. A flute player's music carries in the still, humid air; voices, running water and tree frogs are heard all around. The listener can sense the spatial modulation of the microphone as it traverses acoustic zones in the resonating landscape. Specific sounds are understood as musical signals, such as the rooster at the beginning and a companion's comment at the end.

Sinharaja Soundwalk

Sinharaja Forest Park is located in Sri Lanka's southwest wet-zone and its high endemism makes it an important scientific resource. *Sinharaja Soundwalk* contains sections of a recording made just inside the Kudawa entrance at dusk, in which I follow the eerily mesmerising song of crickets while thunder anticipates the arrival of heavy rain. This piece is structured by the narrative of spontaneous events which guided the sound walk. My verbal comments are used as editing cues. This is the only recording I made in Sinharaja because the following morning I was told that official permission is required to record sound in the reserve. Another walk without my microphones confirmed my expectation that this place is full of sounds worthy of future acoustic engagement.

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Soundscape compositions published online

Remains	*The Wire* Listen: Global Ear playlist, December 2012[20]
Poranui	*A Quiet Position:* Wildeye Edition[21]
Selected works	*SOUNZ:* composer's profile[22]

Radio interviews

23rd September 2011	*Falling Through The Cracks* with Tamara Smith, Plains FM, Christchurch
14th March 2014	*Falling Through The Cracks* with Tamara Smith, Plains FM, Christchurch

Seminars

28th September 2011	unpublished DMA seminar presented at the University of Canterbury
31st October 2011	unpublished seminar presented at the New Zealand South Asia Centre Symposium, University of Canterbury
30th July 2012	unpublished DMA seminar presented at the University of Canterbury
13th July 2013	unpublished paper presented at Australian Association of Literature: Modern Soundscapes Conference, Sydney
7th April 2014	unpublished DMA seminar presented at the University of Canterbury
13th April 2014	unpublished paper presented at Composers Association of New Zealand conference, Auckland

[20] See http://www.thewire.co.uk/audio/tracks/listen_global-ear-post-quake-christchurch-compilation
[21] See https://engravedglass.bandcamp.com/track/poranui
[22] See http://sounz.org.nz/contributor/composer/1834